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AOL's AIM Is Open To Enterprise Developers

BY ALEX HANDY

America Online announced in early March that it would open its popular AOL Instant Messaging platform to developers. The company has launched a new Web site, developer.aim.com, to help disseminate information on the platform, and to act as a central repository for AIM developer relations and community building.

The site currently offers information, tutorials and discussion forums for embedding AIM in applications, creating custom clients and plug-ins, and for adding AIM-user presence information to Web sites. AOL also is offering an AIM SDK free

to qualified developers.

In order to qualify to build a development plug-in for AIM, AOL requires developers to register for keys that will allow their software to run in the development environment. Once a project has been completed, developers must then submit their plug-ins for approval and apply for another key that will allow their plug-in to be distributed and run on the AIM client.

Both key registration and the ability to download the AIM SDK are subject to case-by-case approval by AOL. The company intends to host plug-ins on the

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Builds Forge Ahead With Sandbox Approach

BuildForge Prism ties into IDEs, SCM systems

BY NATALIE ITIN

Build management company BuildForge last month released Prism, a tool that gives developers access to the change management process. The news came at the SD West conference in Santa Clara.

Prism lets developers execute a build in a "sandbox" from within their native development environments, allowing them to perform a "preflight" test to see if their code works correctly, according to Cheri Bergeron, BuildForge's director of marketing. When the developer is ready to check the code back into the

SPECIAL REPORT: BUSINESS INTEGRATION

Experts advise on the best routes to follow for bringing data and apps together



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Read a complete wrap-up of all the news from SD West in the April 15 issue



full project, Prism can automatically do a full integration test, Bergeron said. Prism currently works with Eclipse, IBM's Rational Application Developer and Microsoft's Visual Studio IDEs.

"Prism is important because it's akin to a runtime license. Developers can't change the build process using Prism, but they can kick it off themselves instead of relying on someone

else to do so for them," said Carey Schwaber, an analyst for Forrester Research.

An add-on feature of Prism is LightSpeed, a compiler accelerator tool for ANT, Make and .NET that breaks down build scripts into smaller work units that can be distributed to servers for faster processing. It requires no changes to the script. "From that perspective, you get speed without having some kind of rewriting activity and all the time it would take to convert those in some format. It makes it less

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Serving Up Bits Instead of Discs

Software as a service model requires code rethinking, redesign

BY ALEX HANDY

Michael R. MacDonald, CEO of Visual Mining, has been selling his company's chart and graphing software since 1996. His Maryland-based company, traditionally a commercial software firm, 10 months ago began a move toward offering software as a service (SaaS).

"We had started experimenting around with Salesforce.com's APIs in late 2004. We were looking at doing a Salesforce.com plug-in for our software," said MacDonald, who sat down for an interview at OpSource's SaaS Summit in Napa, Calif., in late February. But as the project progressed, the job of integrating the company's offline charting tools with Salesforce's online data became too complex, he said. "We knew there was

no way [we] could do it simply enough. So we started to look closer at SaaS."

MacDonald said that the move to a services-based model was spurred on by the trailblazers who'd already done it. "What changed the dynamic is that you've got companies like OpSource and Salesforce.com who have done the groundbreaking work. For us, it was relatively easy. It took 10 months to build, 30 days to deploy." Visual Mining now offers both downloadable and SaaS versions of its software.

CONSTANT UPDATE

The ability to deploy continuous updates directly to the customers is a huge advantage

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Exadel: Apply Eclipse's Model To Server Apps

BY EDWARD J. CORREIA

Can Eclipse be everything to everyone? A proposal now before the Eclipse Foundation suggests that what makes the pliable environment so attractive for creating customized desktop applications can do the same for server-based ones.

The proposal, brought by development tools and services company Exadel, advocates extending Equinox—an implementation of the OSGi framework used by Eclipse for its plug-ins—to also include enterprise

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Microsoft
Visual Studio 2005

New JRules Release Rewrites the Rules

New Eclipse-based ILOG tool syncs authoring environments

BY JENNIFER DEJONG

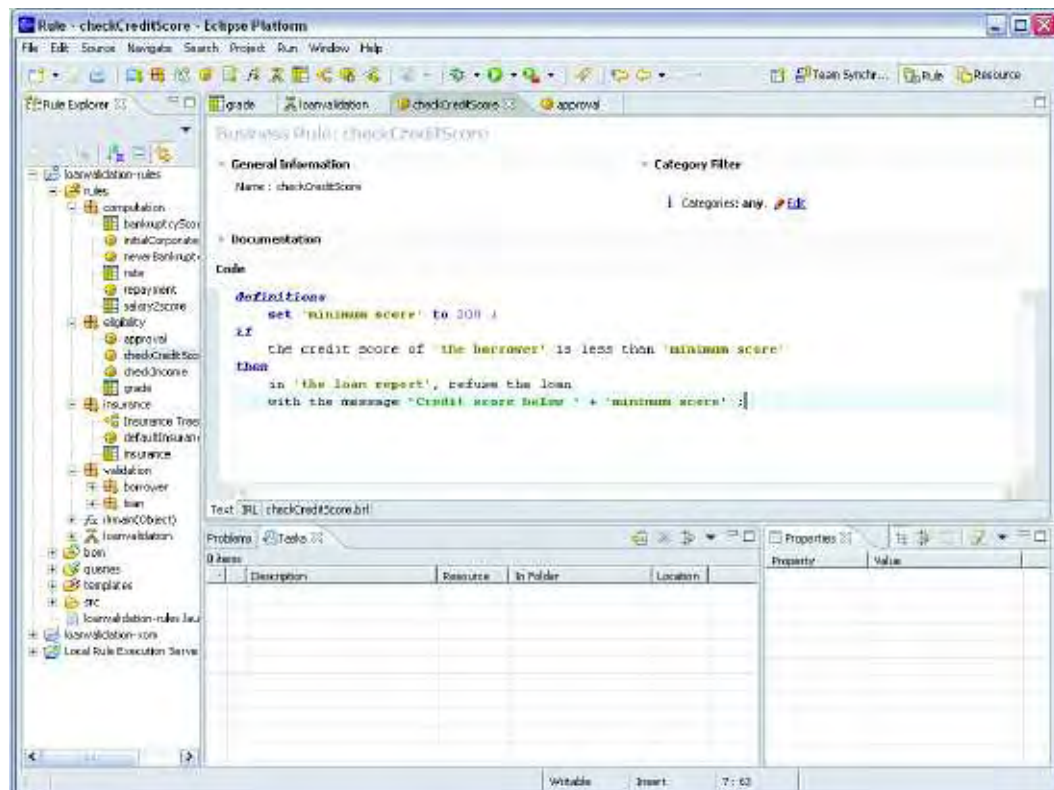
ILOG has rewritten its Java business rule management system, scrapping the software's proprietary underpinning for Eclipse, and adding separate but synchronized authoring environments for business users and developers.

The Mountain View, Calif.-based company was expected to announce last month the coming of JRules 6.0.

"Business rule management is one of those weird technologies," said ILOG director of product marketing Henry Bowers. "It has to serve two masters [business users and developers] who live in different worlds, and follow different processes and procedures." JRules 6.0 accomplishes that by providing two environments. RuleCare is aimed at

business users, who own and update policies, such as which credit terms apply to which customers. RuleTech enables developers to complete the behind-the-scenes integration work that lets the if-then rules contained in business policies interact with the applications they govern. "You can't give a development environment to a policy manager," he said. "And you can't ignore the integration, debugging and testing issues that the [development] team has to deal with."

Previous versions of JRules allowed developers and business users to tailor the user interface according to their respective roles, but the software was essentially a single environment. Designed to serve both parties, it often felt unfamiliar to business users



With its new Eclipse user interface, JRules 6.0 provides separate, but synchronized, authoring environments for developers (shown here) and business users, the company says.

more accustomed to easy-to-use applications, such as those for customer relationship management, said Bowers.

What's more, because earlier versions of JRules required business users and developers to share a single repository, they

couldn't edit the same rule at the same time. "They had to make sure they didn't get tangled up in each other's work," he said. The new version brings together the work of both parties with a rules synchronization technology, which pulls changes

from each environment and reconciles them, before the rules application is deployed.

RULE CHECK-IN

Earlier versions of JRules were based on ILOG's own technology, but 6.0 is built on Eclipse, giving RuleTech the look and feel of the open-source framework. JRules developers no longer need to master a proprietary IDE, said Bowers.

A key benefit of the Eclipse environment is that it lets developers check in business rules the same way they check in source code. Rules and source code are managed the same way, he said. "The best practices for source code—and the checking-in and checking-out processes—apply to rules, too."

Eclipse support also enables automatic generation of Web services wrappers and WSDL files, both of which required hand-coding in previous versions of JRules, said Bowers. In addition, 6.0 checks for rule consistency automatically, running as a background process, whereas earlier versions required developers to activate that feature as needed.

Consistency checking tells a developer, for example, when one rule is identical to another, in terms of the logic it implements, said Bowers. It's critical in rules applications, he said. "This isn't sequential programming. It's not always how rules are meant to interact." ■

Telelogic Rounds Out Modeling Family

BY JENNIFER DEJONG

Telelogic has expanded its family of modeling tools, buying a company that serves the embedded market.

The Swedish company has announced the acquisition of I-Logix, an Andover, Mass.-based company that makes a modeling tool for developers designing embedded systems. Under the terms of the deal, expected to close in late March, Telelogic will pay US\$80 million in cash for the privately held I-Logix.

"We now have a family of modeling tools, with enterprise modeling on one end and embedded modeling on the other end," said Jan Popkin, Telelogic's chief strategist. The family now includes System Architect, for designing enterprise archi-

tectures; TAU, for modeling systems and software applications; and Rhapsody, I-Logix's flagship UML tool for embedded systems. "Modeling is role-based."

Best known for its widely used requirements management tool DOORS, Telelogic has long promoted the merits of "requirements-driven development." Rhapsody meshes well with that message. Like System Architect and TAU, the embedded tool integrates with DOORS. The Rhapsody-DOORS integration was written by I-Logix, noted Popkin.

Asked whether Telelogic plans to integrate Rhapsody with other offerings, such as its change and software configuration managements tools, Popkin did not provide details. He sim-

ply said, "We want excellent integration points, as customers take on more than one tool."

I-Logix will operate as a separate business unit that continues to sell and support the embedded modeling tool under the Rhapsody name, said Popkin, noting that back-office operations of the two companies will be integrated over time.

'GOOD MOVE'

The acquisition of I-Logix does not mark Telelogic's first foray into the embedded market, noted Chris Lanfear, an analyst at Natick, Mass.-based Venture Development.

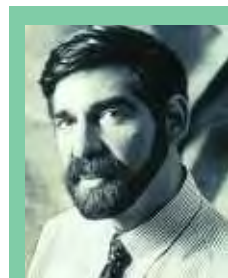
Although TAU is a general-purpose modeling tool, Telelogic also aimed it at embedded developers. But going forward, "TAU will focus on systems and applications modeling and development with more focus toward IT," according to a statement published on Telelogic's Web site. "TAU has had its strongest acceptance outside of the embedded market," the statement said.

Lanfear said buying I-Logix

is a good move for Telelogic. "Rhapsody is the best modeling tool in the embedded space."

Another benefit of the acquisition is I-Logix's relationship with Green Hills, an embedded software developer in Santa Barbara, Calif. "Rhapsody integrates with MULTI [Green Hills' embedded IDE] providing round-tripping and synchronization," Lanfear said, referring to the practice of keeping the model and the code in sync. "It's the first end-to-end experience [in the embedded space]."

Telelogic has a history of acquiring companies, noted Popkin. It bought Popkin's company of the same name last May, adding System Architect to its product lineup. It acquired DOORS creator QSS in 2000, and merged with Continuous that same year, adding change and software configuration offerings to its tool arsenal. "They find best-in-class products, snatch them up and put them in their portfolio," said Lanfear. "If Telelogic hadn't acquired DOORS, they might be out of business." ■



By acquiring I-Logix, 'we now have...enterprise modeling on one end and embedded modeling on the other end.'

—Jan Popkin, chief strategist for Telelogic

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Evidence of this is the **Smart Tag Wizard** that exposes many of the properties to select and display in real-time. There is also a **Data Wizard** which allows you to quickly connect to a data source, map specific fields to the chart and instruct the chart how to use the data. The new **API** was designed with the Visual Studio 2005 object model in mind to make it easier to access complex functionality. Chart FX for Visual Studio 2005 adds a **DHTML rendering engine** that uses the **AJAX** (Asynchronous JavaScript and XML) web development technique to produce chart images that allow full interactivity and support state in web applications. The new **Extensions Manager** standardizes the infrastructure for using the Chart FX Extensions, such as financial, statistical, maps and OLAP, among others. The **Chart FX Resource Center** provides a "Programmer's Guide", the Chart FX API, an Internet Reference and a wealth of samples and charts (with code). *Learn more about the seamless integration and powerful features at www.softwarefx.com.*


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Add JavaScript to DHTML and Gadgets Are Good to Go

Microsoft claims Sidebar simplifies diverse application development

BY ANDY PATRIZIO

With the release of Build 5308 in late February, Windows Vista gained the long-awaited Windows Sidebar and Desktop Gadgets, one of its more anticipated features. Windows Sidebar is similar to other desktop sidebars, such as those of Google and Stardock, but adds mini-applications, called Desktop Gadgets, that can be written in Notepad.

Gadgets are a combination of DHTML, XML, CSS and JavaScript. They can be downloaded from a Web site, e-mailed or installed by an application. Gadgets can be distributed as a .gadget file and installed by double-clicking on the file. Each Gadget will have its own individual settings, and multiple in-

stances of a Gadget can be executed.

There are three types of Gadgets: Desktop Gadgets for the user's desktop, Web Gadgets that will run on Web sites, such as Microsoft's Live.com, or Device Gadgets for use on Windows CE-based mobile devices with a display.

Creating a Gadget is similar to creating a Web page. Developers start with a directory to contain the Gadget files. A DHTML page contains the visual elements, such as the layout and text and graphics, and JavaScript is used to execute the code, and XML is used for the Gadget manifest, an information file with meta-data such as the name, author, permissions and source-file information.



Gadgets (at right) will be part of Vista; a port to XP is being considered.

Any tool that supports JavaScript development can be used to write, test and debug the code, according to Microsoft, although a developer

could, in theory, write the whole thing in a plain text editor.

Gadgets have access to most Windows technologies, so they can draw from a wide variety of

data sources. One of the sample Gadgets available with Vista is an RSS reader; others draw data from Web pages and ODBC sources.

Gadgets are intended to be single-purpose tools, but should a developer wish to build out their Gadget into a complex application, Microsoft said that Gadget intelligence written in JavaScript can be converted into a larger application in any JavaScript development tool, such as Visual Studio 2005.

Gadgets and the Sidebar will be a part of Windows Vista when it ships later this year. Microsoft said it is evaluating whether to make an XP-compatible version of the tools.

Gadgets can be downloaded from microsoftgadgets.com. ■

Move to 64-Bit a Net Gain for Microsoft

Company documents the mostly painless migration of Microsoft.com

BY ANDY PATRIZIO

In March 2004, a year before the release of Windows Server 2003 x64 Edition, Microsoft began migrating its own servers from 32- to 64-bit hardware and operating systems. By April 2005, all Microsoft.com production servers were running on systems based on AMD's Opteron x64-bit processors.

The company took notes, and in late February released a white paper on MSDN that documented its yearlong migration experience.

Microsoft.com was built on 80 identically configured Web servers in 10 load-balanced clusters of eight servers each. Microsoft could have cut the number of machines it needed for the new 64-bit cluster in half. Instead, it chose to keep the same hardware pool size so it could expand in the future. The new system consists of quad-processor 1.6-GHz AMD64 Opteron-based machines with 8GB of memory each.

The new servers were configured with the same content and applications as the old. Each server ran 350 virtual roots, 190 IIS Web applications and 12 application pools. The new systems were run-



'With the hundreds of applications running in these worker processes, we were running out of memory at a very fast rate.'

—Chris St. Amand, senior systems engineer at Microsoft

ning Windows Server 2003 x64 Edition. In theory, this meant that existing 32-bit apps could run unmodified, said Patrick O'Rourke, senior product manager for Windows Server.

The biggest concerns Microsoft had in this migration project were verification of third-party dependencies, and making sure all of the drivers and important pieces were

available, such as anti-virus and backup software. Also important was the verification of scripting dependencies, since some scripts depended on 32-bit COM objects and would require 32-bit cscript or wscript scripting host versions.

The 32-bit Internet Server Application Programming Interface (ISAPI) filters, COM components and ASP.NET version 1.1 applications all ran on the 64-bit hardware without any modifications. The project team also found that when properly configured, the Windows on Windows 64 (WoW64) emulation environment eliminated the need for modifications to other apps. The team also had to learn the WoW64 file system and registry redirection behavior. More on WoW64 later.

Not surprisingly, the main limitation of Microsoft's old systems was memory. According to Chris St. Amand, senior systems engineer at Microsoft, half of the 32-bit processor's 4GB maximum addressable memory was gobbled up by Windows. "We had a very tough time dealing with the [remaining] 2GB address space in our IIS worker processes. With the hundreds

of applications running in these worker processes, we were running out of memory at a very fast rate," he said.

Microsoft used virtual memory-based process recycling to avoid running out of memory, St. Amand said, but that resulted in a performance hit. Some applications would hit the virtual memory limit in less than 10 minutes, he said.

OPTERON OPTIMAL

According to Todd Weeks, senior director of operations, Microsoft chose Opteron because it was the only viable option that implemented the x64 instruction set when it began the process. "At the time, the [Intel] Xeon 64 technology was still at a very early stage, and there wasn't any production-ready hardware available for us to use," he said.

And Itanium, Intel's other 64-bit platform, presented issues as well. Weeks said that using Itanium would involve significant performance overhead when running 32-bit processes under WoW64. Neither IIS nor SQL Server were 64-bit ready yet. Weeks said that WoW64 is handled much better by x64-compatible processors since x64 uses x86 registers.

Microsoft is moving several key products to the 64-bit platform, and some will only be 64-bit starting with their next release. SQL Server 2005 and .NET 2.0 are already 64-bit-enabled, and Longhorn Server R2 and Small Business Server will be available in 64-bit versions. Exchange 12 and Windows Compute Cluster Server will be 64-bit only; both are due this year.

THE ENDGAME

Following the migration, Microsoft has seen two main areas of improvement. First, CPU utilization dropped more than 50 percent due to greater memory capacity eliminating the need to swap memory to the hard disk. CPU spikes of 100 percent were common as applications ran out of memory and virtual memory had to be recycled. This was completely eliminated, as applications no longer ran out of memory.

The second major performance gain was in response times for applications. ISAPI applications response times went from 135ms to 53ms, and static request responses dropped from 135ms to 3ms, the company claims. ■

OpenDocument Format Gets New Allies

BY ALEX HANDY

The battle for the acceptance of the OpenDocument Format has been bolstered by the formation of an alliance created to evangelize the use of ODF in government organizations

around the world. The formation of this alliance was announced in early March in Washington, D.C., where members met for the first time to discuss formal approaches to expanding acceptance of ODF.

The move to ODF was spurred by the state of Massachusetts. Last year, the state led the charge by mandating that all of its agencies standardize around open document formats (PDF and ODF)

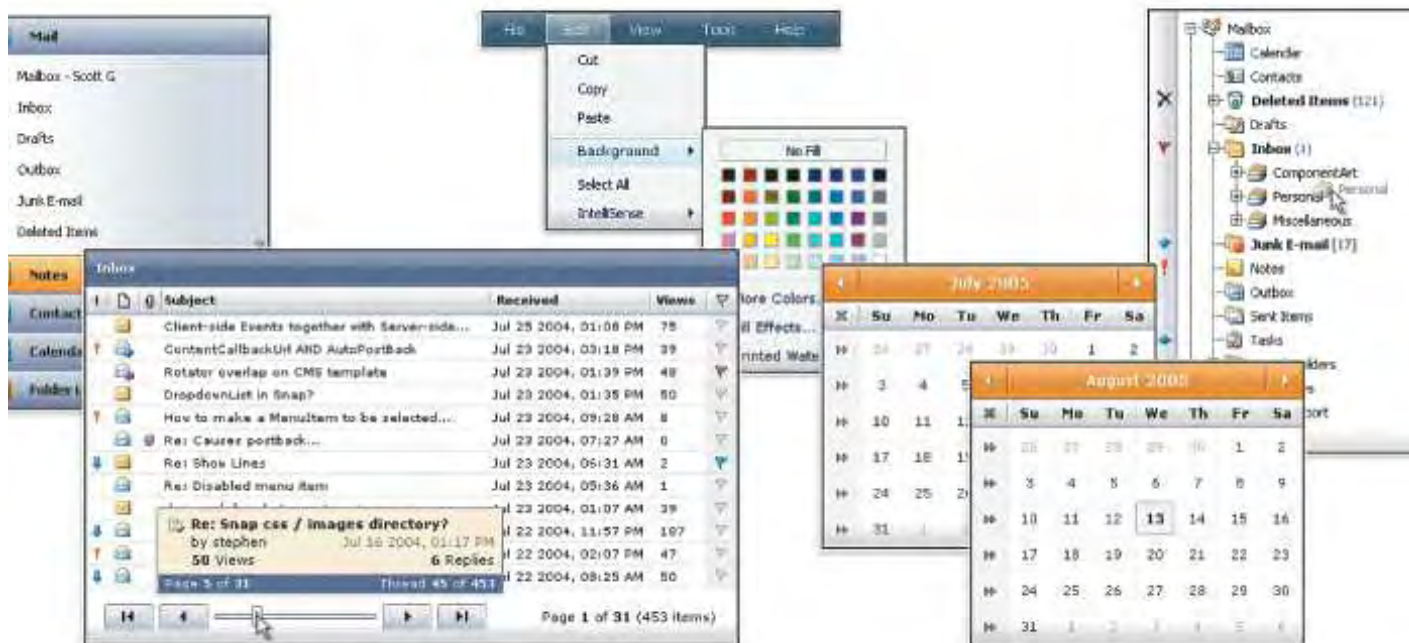
by the end of 2006. The move was seen as a direct challenge to Microsoft, though the state says that it will not be replacing Microsoft Office. State officials have said that they intend to patch the state's

thousands of copies of Microsoft Office with software that will allow users to save and read ODF files.

Microsoft refused to comment for this story. The company has been heavily involved in lobbying activities within Massachusetts, and currently maintains that it will not add support for ODF in its Office products.

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TURNING POINT

Bob Sutor, vice president of standards and open source at IBM, said at the ODF Alliance meeting, "I think we've turned the corner. This year it's about focusing and tying a lot of this together into an easily digestible form. I think there's going to be somewhat less emotion in 2006, just more step-by-step adoption. [We'll see] ODF lights turning on around the globe."

Sutor went on to say that the purpose of the ODF Alliance is to spread information to governments that will help with the adoption of ODF. The alliance, said Sutor, is a group that can answer questions and alleviate fear of the transition, as well as offer suggestions and information that can make the move to ODF as painless as possible for the organizations now considering the switch.

Sutor's comments were echoed by an ODF Alliance news release that claimed more than 13 countries are considering making the move to ODF.

Simon Phipps, chief open-source officer at Sun Microsystems, said that ODF is a hundred-year format. He hopes that widespread adoption of the ODF format will allow documents to be stored and reread 100 years from now. Phipps said that the early days of personal computing saw many disparate document formats used across the many types of hardware and operating systems available at the time. He said that there are now documents written only 20 years ago that are almost impossible to recover due to the use of proprietary media and formats. Both Sun and IBM offer alternative office suites that support ODF.

The ODF Alliance is still soliciting members. Go to www.odfalliance.com for more information on the format and the alliance. ■

PreEmptive Offers Enterprise-Level Code Protection

BY ANDY PATRIZIO

PreEmptive Solutions, a developer of source code obfuscation technologies, has introduced its enterprise obfuscation solution for both Microsoft .NET and Java. Both products, Dotfuscator Pro for .NET and DashO for Java, are designed to make .NET and Java code harder to

reverse engineer.

In addition to protecting the code, both products optimize the code, down to the methods, allowing programmers to parse out the pieces of code they aren't using to create the small-

est, most efficient executable.

The two tools provide the developer with control over the level of obfuscation. Distributed tools allow for users of the binary, such as quality assurance testers, to work with the obfus-

cated code. Dotfuscator Pro is integrated with Visual Studio 2005, while DashO will run on any Java-enabled platform.

The enterprise versions of Dotfuscator Pro and DashO offer full code risk assessment

to expose security weaknesses, a process to review weak points in the security of development practices, on-site security consulting services, and best practices tailored to the company's development environment. ■

GCC on Itanium To Get a Boost

BY ANDY PATRIZIO

The Itanium Solutions Alliance and the Gelato Federation have announced plans to make Itanium processor-specific improvements to the GNU Compiler Collection (GCC), giving the Linux compiler a needed performance boost.

GCC is currently available on Itanium Linux, but it is not tuned specifically for the EPIC architecture, according to Mark Smith, managing director of Gelato, a global technical community dedicated to the advancement of Linux on the Itanium platform. "What's given Itanium a black eye with Linux folks is people take GCC code from other platforms and recompile it and it's slower than their x86 version," he said.

GCC is a set of multiplatform compilers for C, C++, Fortran, Objective-C, Java and other programming languages developed by the Free Software Foundation. It is considered the de facto Linux compiler standard.

Gelato will begin by working with the University of Illinois at Urbana-Champaign, a Gelato member, on the superbloc optimization. Superblock is a means to simplify moving instructions between basic blocks of code. Smith expects an 11 percent performance improvement when the optimizations are done.

The process is being done in conjunction with the GCC compiler's development cycle, which means it could take six months or more just to get the superbloc improvements added to the codebase, said Smith. Gelato also plans to tune rotating register support and memory disambiguation on Itanium, both of which will give double-digit improvements in integer and floating-point performance. ■



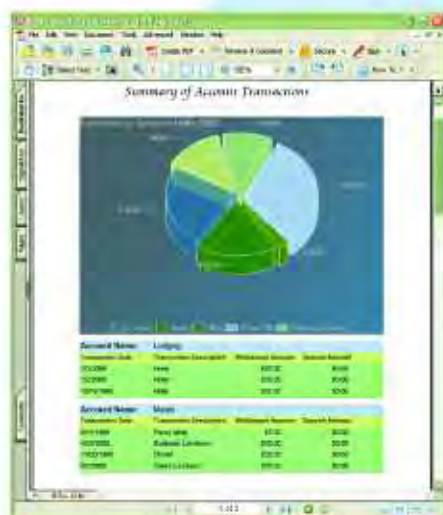
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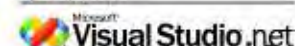
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News Briefs

COMPANIES

Green Hills Software and **Esterel Technologies** have partnered to create a model-driven solution for safety-critical embedded software code generation. Based on industry standards DO-178B, IEC 61508 and SCADE, the integration will span modeling, code generation and compilation. Esterel's SCADE Qualified Code Generator will output code that is integrated with Green Hills' Integrity real-time operating system ... **Transitive** has announced it will work with **Intel** to accelerate the migration code from legacy RISC environments to the Intel Itanium 2 and Xeon processors. Intel will provide funding and engineering resources for the development of Transitive's QuickTransit hardware virtualization technology for the Intel processors ... **Adobe** and **Symantec** will work together to provide the Norton Internet Security 2006 suite to users downloading Adobe's Reader for PDF documents. Adobe claims Reader—and its Macromedia Flash Player—are installed on 600 million connected PCs and devices worldwide.



NEW PRODUCTS

Red Earth Technologies has announced the release of **Superior SQL Builder Standard Edition**, a less-expensive version of its professional edition tool for deploying day-to-day SQL scripting requirements and aiding in the creation of complex SQL scripts. Among new features is improved script management.

UPGRADES

QL2 Software has released **WebQL 3.0**, a program for reading text represented as images in Web pages and PDF documents by using optical character recognition. New features include grid computing capabilities for large data integra-

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Java 'Faces' to Get A New Expression

Revision will bring JSF, JSP expression languages together

BY ALEX HANDY

Since the JavaServer Faces project was completed in 2004, the keepers of Java have struggled to integrate it with the core Java platform. JSF's close cousin, JavaServer Pages, has already undergone this integration, thus syncing its release schedules with those of the core platforms. As a result, two disparate expression languages emerged. But now that JSR 245, a proposed spec for JSP 2.1, has neared completion, the expression languages of JSF and JSP will be aligned and JSF 1.0 will be phased out.

Dennis MacNeil, product director for Java technologies at Oracle, participated in the JSR 245 review process and said that the completion of the specifications for JSP 2.1 kills two



The disparate expression languages were an issue back before J2EE 1.4 was finalized, says Oracle's MacNeil.

birds with one stone.

"The different expression languages have been identified as an issue since before J2EE 1.4 was finalized," said Mac-

Neil. "What this is really doing is acknowledging that JSF is ready for integration into the core platform, and there's no need for two expression languages in the core platform." The JSF experts group was also consulted to help bring the two languages into synchronicity.

In addition, said MacNeil, the release schedules for updates of both JSF and JSP should begin to coincide with those of the core Java platform now that JSF is beginning to gather such a dedicated following.

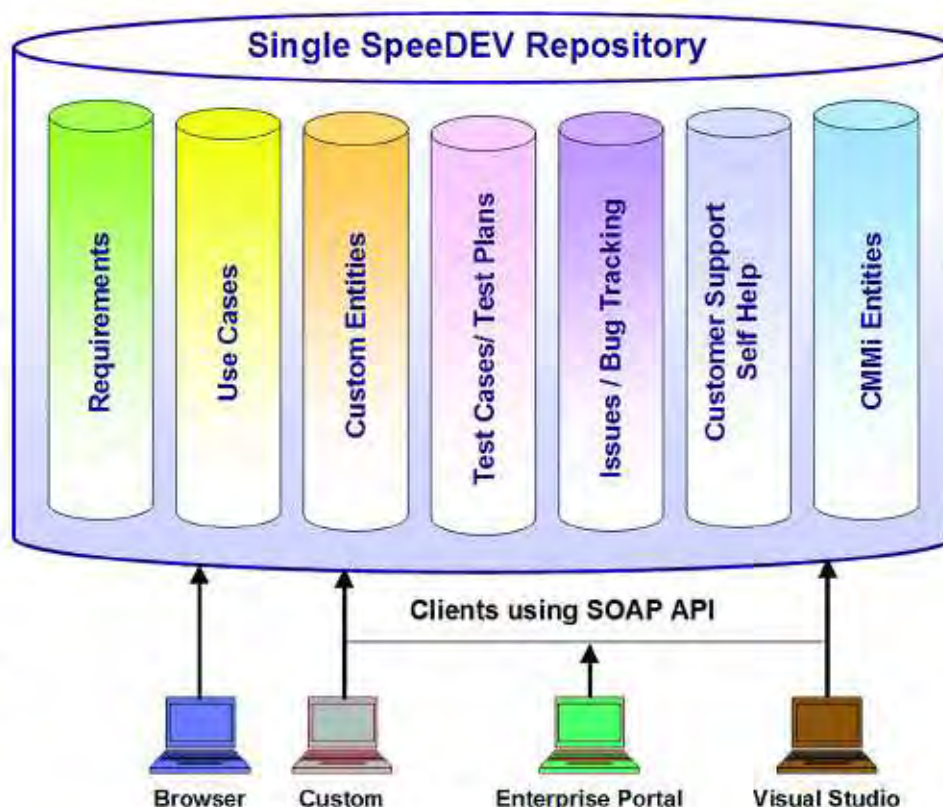
MacNeil also said that JSP and JSF each are experiencing continued growth, and that this revision, combined with the JSF 1.2 specification JSR 252, will make things easier for developers. "Focusing on the ease of development around JSF is not just happening within the specification," said MacNeil. "It's also happening with the Apache project MyFaces and within Eclipse. You're seeing a lot of uptake with developers with JSF and JSP. I think the impact will be felt across the board, not just within your application server, but within Eclipse and JDeveloper." ■

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Rash of Red Hatters Go Their Own Way

BY EDWARD J. CORREIA

It happens to the best of them. A start-up gathers young, talented developers, grows into a successful, sometimes multinational company, then loses those talented individuals as they

leave to start other ventures.

A case in point is Red Hat, which in recent years has seen the exodus of members of the eCos team it acquired along with Cygnus in 2000, its former engineering vice presidents

Kim Knuttila and Erik Trone, and others who left to form Specifix, a Linux consultancy.

The most recent departures include a group of early Red Hat technology and sales pioneers, including kernel engi-

neering team leader Michael Johnson and vice president of North American sales Billy Marshall. They joined Trone—who had since split from Knuttila—to found rPath, which develops a Linux-based soft-

ware delivery model that abstracts the underlying hardware to simplify deployment.

"Trone was there when [Red Hat employed] less than 20 people; now it's about 700," said Keith Boswell, vice president of marketing at rPath. Former Red Hat vice president of sales Dave Cotton joined rPath in February.

"What you see is people that were part of that entrepreneurial phase of Red Hat and now they want to do it again," Boswell said of the departures. "Now Trone goes from VP of sales to running his own company," said Boswell, who most recently was a vice president at TogetherSoft. Red Hat did not respond to repeated requests for comment on the apparent brain drain.

Founded in 2003, Specifix in mid-February added former Red Hat vice president James Prasad as its COO. According to CEO Knuttila, Red Hat is likely to continue losing its top guns as it turns away from Linux for embedded in favor of the enterprise. "It's a business [Red Hat engineers] are not excited about."

The company's embedded enthusiasm began to waver in 2002 when it abandoned the eCos RTOS. Red Hat still employs many of the approximately 120 Cygnus engineers, Knuttila said. "We're interested in quite a few of the guys that work there, if they want a change," he said. Specifix has about a dozen openings, he added.

ALTER ECOSYSTEM

"We thought that after Red Hat succeeded, it would start to become a springboard for other companies and for people that wanted to do it again and build around the ecosystem they created," said Boswell.

That eventually happened, he said, but "it's taken a while longer than some people hoped to make that happen."

Meanwhile, as Red Hat's market focus shifts away from embedded, Knuttila, whose company focuses on custom engineering using open-source development tools, is all too happy to step into the void. "There's a large [embedded] market that isn't being addressed. And it was Red Hat's market to lose." ■

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Actional Gains Visibility Into Corporate Lifeblood

BY EDWARD J. CORREIA

Comparable to the use of radioactive imaging to contrast areas inside the human body, new features in Sonic Software's Actional 6 SOA management platform include better visibility into business processes and control over runtime SOA components, according to the company.

"You can tag a transaction and watch where it goes through the IT infrastructure," said Sonic CTO Dan Foody of new visibility features in version 6. "[Actional is] now process-aware. This lets us automatically discover all the steps within a process. We can also apply policies to processes themselves," he said, claiming that competitive solutions require such processes and policies to be created individually.

Also new is runtime governance, which according to David Gehringer, Sonic's vice president of product marketing, can identify services that have not been written to adhere to previously set governance policies. "People find that lots of things get into production accidentally. The problem with services is that they're really easy to connect. Somebody can add a service that calls another service that you don't know about. Is that service compliant? Is it secure?"

Gehringer said that when such unauthorized services are discovered, the service can be disallowed or have a pre-determined policy applied to it. The capability also can help with adherence to compliance regulations. "Because when you breach privacy laws, it's usually the things you don't know about. So automatic

protection mitigates that risk substantially."

ZONES OF TRUST

Also new are so-called trust zones, which Gehringer said

can apply security in the context of a process. "Unlike what people do today with checkpoints, trust zones understand the path. If you have a developer call another service around

[your company's] security or ID management because he grabbed a WSDL, trust zones will not accept a transaction because it's not coming from the right location, even if it has

the right key or token." Trusts also can be set up for a specific business process, he said.

Actional 6 became generally available on March 6. Sonic is a division of Progress Software. ■

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Tellme Somethin' Good: Voice Tools Project Delivers API

BY EDWARD J. CORREIA

An API is now available for the Voice Tools Project, an IBM-led effort to permit speech recognition applications to be built from the Eclipse Web Tools Project. The API permits voice server

developers to implement their products to conform to the VoiceXML-compatible tools.

The first such implementation is from Tellme Networks, a Voice Tools Project (VTP) contributor. Tellme offers a free

service at studio.tellme.com that apps built with VTP tools for mobile phones and other handheld devices or the Web can connect to. The service allows voice-enabled apps and Web services to navigate the

Web via voice and have Web content spoken back to them.

According to IBM's Brent Metz, who leads the project, the API is important because unlike Web apps, which run through just a few major browsers, there

are hundreds of platforms through which voice-enabled applications are expected to be launched. "APIs allow you to link tools together," he said, such as IBM's WebSphere Voice Server and its underlying human speech interpretive engine. "Another vendor's tools might not be able to talk to our server. These tools allow products to talk to each other in a generic way." IBM plans to release a compliant implementation of WebSphere Voice Server this year, he said.

IBM also has posted to its alphaworks site (www.alphaworks.ibm.com/tech/mmtp) the Multimodal Tools Project for Eclipse, a series of speech-enabled applications written in XHTML+Voice (X+V) that developers can download for free. "IBM builds off the open-source software that allows you to write speech-enabled applications that run inside [any X+V-compatible] Web browser," Metz said, including Opera and Access NetFront. The applications permit navigation and data entry using voice commands and can simplify Web browsing from devices with small displays, where speech commands might be preferable for navigation. ■

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Fault Factory Makes Errors

BY ALEX HANDY

There are certain types of network errors that just can't be simulated by unplugging the cable. That's why Extradata created Fault Factory 1.0, a tool that purposefully mangles API socket calls so that users can test their application's error handling.

Julian Roz, the owner and founder of Extradata, said that unplugging "is a good technique, but doesn't give you all the various ways it could go wrong. In Java there are libraries that handle [severed connections], but the problem is, the way it is handled may not be desirable for your application."

Roz said that Fault Factory 1.0 can simulate many different network outage conditions, including many that will infrequently occur in the field. But, he added, if it happens only once, that will still be a thorn in at least one customer's side.

Fault Factory 1.0 is available for Windows 32 platforms for US\$179.95 per seat. ■

SOA Trio Jazzes Up Tools

DataFlux, TenFold, Sunopsis boost their integration platforms

BY EDWARD J. CORREIA

A threesome of integration tool providers in March SOA-enabled or enhanced the capabilities of their SOA-based data management and integration platforms.

DataFlux, a division of business intelligence and analytics software provider SAS, has released DataFlux CDI Solution, a customer data integration tool that it claims can manage client data across enterprise systems using Web services protocols.

The new tool, an extension of its Data Quality Integration Platform, also includes preconfigured business rules for managing customer data, and a drag-and-drop workflow builder for modifying prebuilt jobs or adding data sources and creating custom rules.

TenFold unveiled EnterpriseTenFold SOA 2006, an SOA-enabled edition of its application development platform.

Among close to 50 new features that speed development and enable it to "coexist with .NET and J2EE technologies from other vendors," according to TenFold president and CEO Robert Felton, are an interface for assembling applications from new or existing services and the ability to deploy all or part of them as stand-alone services. The tool also simplifies customization of application UIs, enhances security, and supports the latest Oracle client interface, Apache Web server and Firefox and Safari browsers.

Sunopsis released version 4.1 of its Application Integration Platform, which it says now gives developers a means to create a unified view of data residing in enterprise applications and systems.

The AIP platform consists of three main components: Data Conductor, which handles data integration requirements for warehousing, business intelligence and performance management and migration; Event Conductor, which manages asynchronous application requirements for event-driven systems; and Service Conductor, the SOA component for integrating synchronous applications.

Binding the three modules is the Active Integration Hub

(AIH), a persistence engine and event database that captures all the data and business events flowing to and from sys-

tems that it knows about. In version 4.1, the AIH now automates integration requirements using business rules.

The hub, which performs bidirectional, real-time synchronizations with all linked databases and applications, gives

developers a constant view into all enterprise data.

The Common Format Designer, a new tool for deploying hub features, is used to create data models from existing metadata elements and automatically generates the corresponding data interfaces for data movement and synchronization. ■

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W3C Launches Incubator

BY ANDY PATRIZIO

In an effort to spur on lesser or vertical projects, the World Wide Web Consortium has launched Incubator Activity, an initiative to encourage Web-related technologies that may not warrant a full-blown W3C Recommendation Track working group.

A W3C Recommendation Track requires a formal charter and then has to be approved by the full membership of the W3C, which can take several months just to get the process rolling, according to Steve Bratt, CEO of the W3C. An Incubator group can get started in a few weeks after submitting the charter and the endorsement of only three W3C members, he said.

Once the Incubator group (called an "XG," as opposed to the "WG" working group designation) is started, the group runs itself and the process is the same as a working group, with the same requirement to be fair and open, said Bratt. The group then has all the usual benefits of a formal W3C working group, such as access to the W3C mailing lists, publications, teleconferencing facilities and the group's Web site.

Bratt said the working group process

works fine, but that something was needed for more low-end projects. "Imagine if the W3C just threw XML or SOAP and WSDL out there without testing? We're all about building consensus for these foundation technologies," he said.

Some projects may never get to a full recommendation track because they don't need it, like vertical apps, and some may not make it simply because they don't work out.

By the time a team is close to being done with an Incubator project, it can start the process of chartering a more formal working group, Bratt pointed out. "The day you publish your Incubator report, you could have a new working group start up."

The first Incubator group will be the W3C Content Label Incubator Group, which, according to the W3C's site, hopes to find "a way of making any number of assertions about a resource or group of resources. In order to be trustworthy, the label containing those assertions should be testable through automated means."

More information on the W3C's Incubator project can be found at www.w3.org/2005/Incubator. ■

Build Forges Ahead With Prism

◀ continued from page 1

brittle because it doesn't require any changes," said Bergeron.

BuildForge also updated its flagship build and release process automation platform, FullControl 4.0, which lets the people in charge of the build process define and enforce that process, according to Bergeron. Manifest is a new add-on to FullControl that acts as an inventory management system. It automatically keeps track of critical build server information, including operating systems, patch levels, disk utilization and compilers, Bergeron explained.

BuildForge also created what it calls

ALM Adapters that tie FullControl 4.0 to source control, test and bug-tracking software. The integrations that are ready now are for Borland's StarTeam, IBM's Rational ClearCase and ClearQuest, Microsoft's Visual SourceSafe and the Subversion system. An adapter kit allows developers to create their own custom integrations, she noted.

"BuildForge not only manages the assembly process but also connections into other pieces—into the developer side, the source control side and also the test side—so we can keep the entire process more in sync," said Bergeron. Pricing was not disclosed. ■



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Software as a Service

← continued from page 1

tage of hosted SaaS applications over traditionally licensed software, according to Marc O'Brien, CEO and president of Projity, a San Mateo, Calif.-based company that offers a SaaS-based alternative to Microsoft Project.

O'Brien explained the road to SaaS requires tough decisions, and that those decisions apply to ISVs looking to switch as well as to companies like Projity that started out using the SaaS model. "There are obviously a lot of middleware standards that are still emerging, and even the platform choice is complex."

O'Brien detailed the difficulties of integrating external apps and databases into the services-based architecture and said that decisions about middleware, databases, hosted architecture and hosted operating systems are fundamental.

"A bad choice made early on can cause havoc down the road if an integral piece of software falls behind, stops being updated, or simply becomes incompatible with the goals of the project," he said.

O'Brien said that his company decided to use free software to build its infrastructure for two reasons: First, it required no initial outlay in funds to get the prototypes up and running; and second, his company competes directly

with Microsoft, giving Projity extra incentive not to use Windows.

But Treb Ryan, CEO of services hosting company OpSource, which is promoting its services to help companies migrate to SaaS (and which hosted the February summit), said Microsoft gave his company a lot of licensing leeway, and now OpSource customers can get up and running on .NET for free. But, whether services companies choose .NET or Java, or Linux or Windows, the fundamental rules for success are the same, agreed Ryan and O'Brien.

CLOSE QUARTERS FOR DATA

Of supreme importance for a successful service design, O'Brien said, is multi-tenancy, which he described as the use of one database for all clients, rather than storing each individual user's [hosted] information on separate servers. "Multi-tenancy must be a goal of the initial design document because security and performance issues associated with multi-tenancy must be addressed at the most basic levels of the codebase."

Ryan agreed that the multi-tenancy issue is paramount and is a primary difference between SaaS and application hosting, where the hosted applications often run on dedicated servers for each cus-



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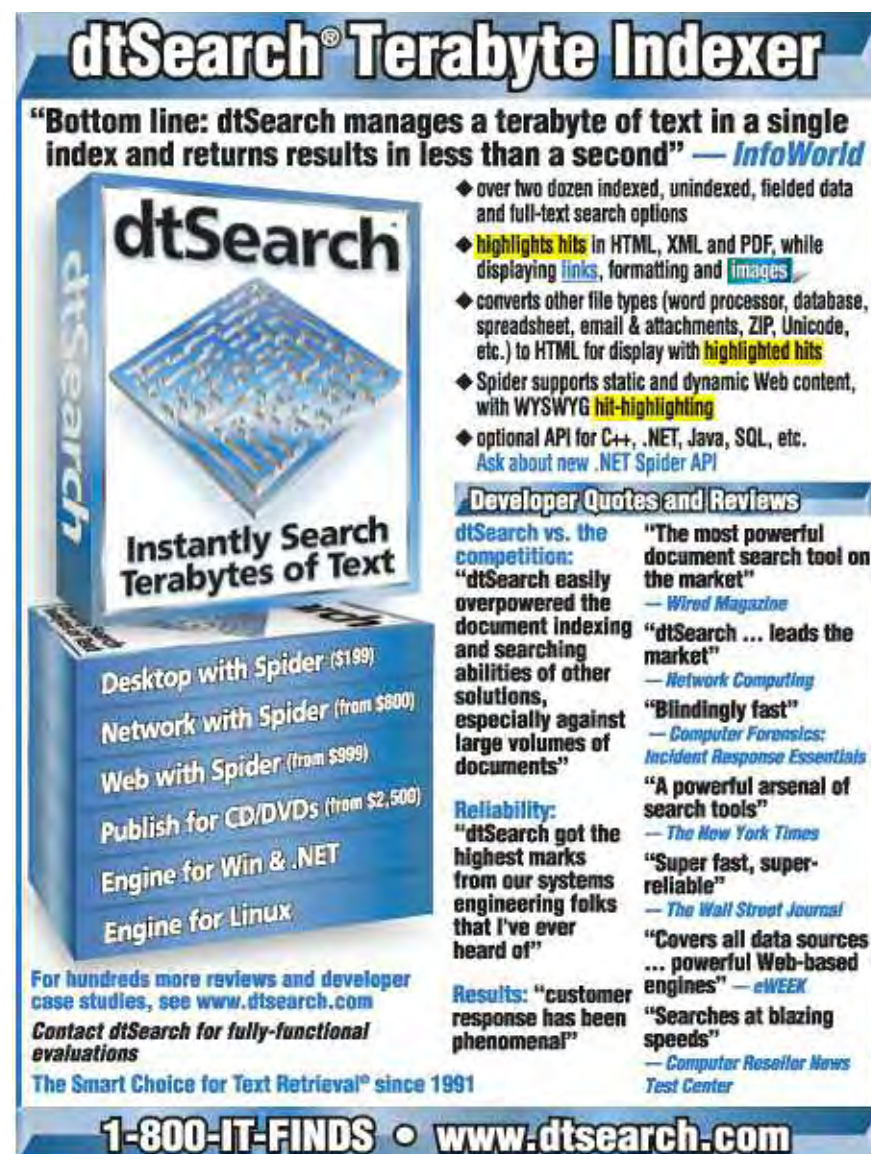
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Could Require Redesign



'A bad choice made early on can cause havoc down the road.'

—Marc O'Brien, CEO and president of Projity

tomer, and where the applications might be customized for each customer's needs. To be successfully deployed as SaaS, Ryan said that all customers have to be running the same application. "If you do not do that, all you're doing is buying servers for every single customer" and losing the advantage of economies of scale, he explained.

Ryan said that the mindset of companies looking to move from retail to services must change. "In a traditional software company, getting it gold by the release date is critical. If you don't, the sales guys have nothing to sell, and you'll be killed by Wall Street. In a SaaS organization, you now have a

development team who has to continue to add features on a regular basis. You have to have guys who write tight, clean, efficient code. That's never been a real big concern for enterprise application vendors before."

Ryan continued to skewer the quality of boxed software. He said that in traditional retail or channel models, nonfunctional software is sometimes seen as the customer's problem. He said that a typical tech support call would find the ISV troubleshooting the customer's desktop, evaluating the functionality of the end user's machine and his installed software packages. With SaaS, however, Ryan said that 100 percent of the prob-

lems encountered will be the vendor's fault "unless the [network interface] card on the end user's computer is broken."

But, Ryan said, there are great benefits that offset this new focus on code quality. "The great give-back for all this, though, is that they don't have to go test on 19,000 different systems," Ryan said that SaaS programs need to work only on the specific hardware and software that the SaaS host uses. By contrast, traditional commer-

cial software might need to support a dozen different versions of Oracle running on various versions of Windows, and all the combinations thereof. "SaaS takes a lot of time out of QA so you can focus on writing cleaner code with better efficiency," Ryan added.

Another sticking point, said O'Brien, is that moving to SaaS will likely cause the sales team to become disgruntled. O'Brien suggested addressing the interdepartmental strife that moving to a services model can cause. "The very first thing you would have to do is rationalize this within your existing business

structure, and convince your vice president of sales that there would be a tectonic shift in sales commissions, and convince your board to accept near-term losses."

Despite the difficulty of the transition, MacDonald is glad his company is moving to SaaS. "I believe that SaaS is where [the software industry] is going to be," said MacDonald. "We used to use an on-site CRM system which caused all kinds of problems. When we moved to Salesforce.com, we didn't have to have IT staff fixing it all the time. We understand the benefit to customers." ■

AIM Open to Enterprise

◀ continued from page 1

AIM developer site, but it is unknown how the company will handle the distribution of enterprise plug-ins.

Plug-ins for commercial sale or for use on mobile devices require special licensing that must be negotiated with AOL; costs were not disclosed. Plug-ins that provide voice transport capability over a mobile device also are required to go through

separate approval channels. The licensing agreement strictly forbids the building of plug-ins for use in sending spam or spim (spam that targets instant messaging).

Mark Spencer, president of Digium, created an open-source alternative to AIM in 1998. He called it Gaim, and it supports not just the AIM protocol, but those of ICG, Jabber and Yahoo. News of

AOL opening AIM to developers did not rouse his excitement. "Right now, it would seem like a big yawn for me, unless they're bringing out something that they didn't already have."

Spencer, who now heads the Asterisk open-source PBX project, said the would-be AIM developer community already has plenty of alternatives that do not impose AOL's restrictions. ■

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Two Approaches To Application Parallelism

Tangosol, ASPEED take on app performance

BY EDWARD J. CORREIA

A pair of tool makers in late February unveiled products aimed at spreading application tasks across multiple processors or cores to improve performance.

One such tool is Coherence 3.1, the latest version of Tangosol's distributed data caching solution for Java applications that, according to company president Cameron Purdy, takes a unique approach to performance improvement through parallelization. "We make data access more efficient by keeping it in the application tier," he said.

This is accomplished, he said, through new data grid agents, which move executable code to the JVM on the machine that stores the data being requested. "It's like stored procedures [in SQL]. If you can get the processing to the server that wants the data, then all you have to do is move a little bit of data about the process that has to execute."

In the case of a purchase order, he said for example, agents would move instructions around the network rather than the entire order along with its instructions. "That's more efficient than moving the whole order."

More interesting, Purdy said, are aggregate functions. He described this new feature as the ability for numerous machines to separate parts of a process simultaneously. "You can say, 'Here are 1,000 items to process.' If you have 100 machines, [each will process 10 items] in parallel, but it looks like all processing was done locally."

Further, if it is not known which

1,000 items to process, as might be the case with open trading orders at the end of a day, "you can send out a query with instructions for, say, all open trades. At that point, a query executes in parallel and processes things that match the query," he said.

Such parallel aggregation, he claimed, can substantially reduce processing time required for highly complex calculations. "Let's say a user has a portfolio of risk curves that lets them price a risk. Data sets are typically very large. Processing the aggregation in parallel can take what used to be an overnight process down to half a minute."

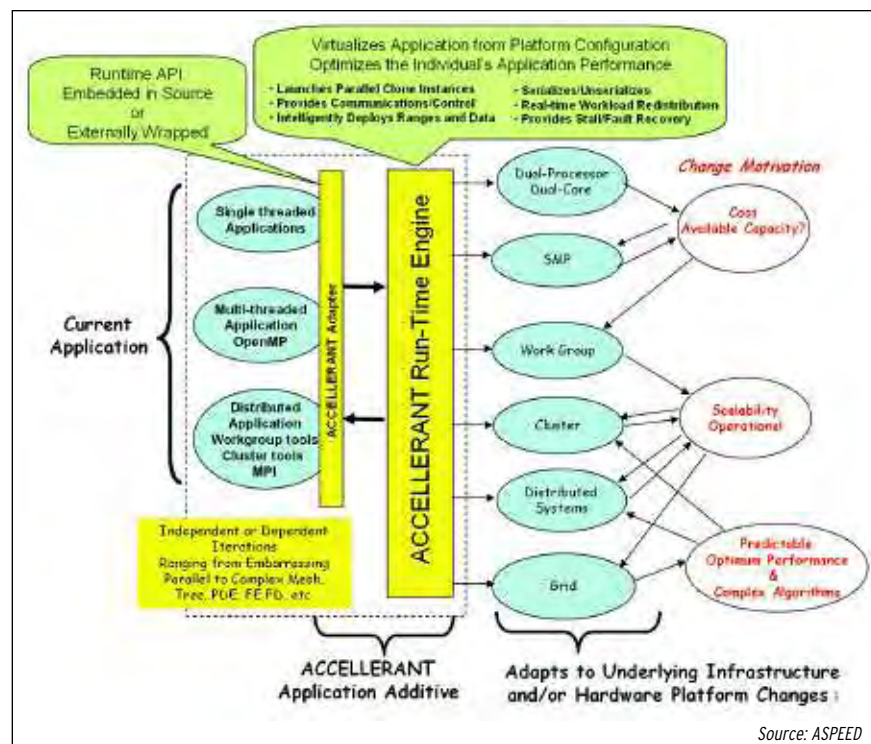
Coherence 3.1 now supports the Java Work Manager interface (JSR 237), which defines an API for execution of concurrent work items in managed systems, and the Timer for Application Servers (JSR 236). Both projects were led by BEA and IBM, whose WebLogic and WebSphere servers also support the specs. "We have the first grid implantation for Work Manager," claimed Purdy. The benefit, he said, is the ability to treat an entire grid environment "like one giant thread pool and partition all the work over multiple threads. If you have 10 servers, an application will see that as a single system image."

Released on Feb. 27, Coherence 3.1 pricing remains at US\$5,000 per server processor core.

LEGAL USE OF ACCELERANT

Talking another approach to grid-style performance enhancement is ASPEED,

► continued on page 24



Source: ASPEED

The Accelerant runtime engine parcels out application iterations, delivering gridlike performance without special infrastructure, claims ASPEED.

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Paul Waibel, QA Engineer, Ceridian



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Exadel Offers Eclipse Its OSGi Implementation

◀ continued from page 1

applications. The proposal was to be made public at EclipseCon, the foundation's annual developer conference, held in Santa Clara March 20-23.

"Because of Eclipse, nobody today is building their own IDE, not even Borland," said Fima Katz, Exadel's founder, president and CEO. Exadel develops tools that are a mixture of open-

source, commercial and home-grown components strung together using the Exadel Component Integration Infrastructure, which is based on Equinox. "Eclipse is unique. It's the

only proven, working plug-in component infrastructure," said Katz. "I think that this will do the same thing for enterprise applications."

The development model, he

said, would remain the same as today's. "You build in Java code and plug in components in a very loosely coupled way. Eclipse allows me to plug in and remove any component I like."

As with the desktop version of Eclipse, developers could build their own plug-ins for adding functionality or reuse those built by others. The difference, he said, is that server-based plug-ins would be scalable for use by many people at once, could incorporate transactional capabilities, and be accessed via a Web-based interface or have none at all. "The idea is to strongly promote code reuse among enterprise developers and decrease time to deployment."

Under the proposal, Katz said Exadel will contribute its complete working solution, which he expects will be called the Eclipse Component Platform. As with all Eclipse-licensed IP, there will be no requirement to return implementations to the community. But the impetus behind the contribution, Katz said, is the hope that some developers will choose to do so. "The idea is to share. If people start using this infrastructure, more components will be available for us to use."

Another new, unrelated proposal comes from Nuxeo, an open-source software consulting firm. According to Ian Skerrett, the Eclipse Foundation's director of marketing, the company is willing to contribute parts of a system it developed for the French Press Agency to enable Eclipse to hook up with enterprise content management systems.

"This will allow a framework for [Eclipse Rich Client Platform, or RCP] applications to hook into systems like Documentum and Interwoven," said Skerrett. The system allows reporters to file stories through a desktop application that also manages their articles and submits them for publishing. "The client is written with RCP as the foundation."

PROJECT FRUIT

EclipseCon also was to be the backdrop for the first code release of two major Eclipse projects. The Data Tools Platform project, the Sybase-led project that kicked off in August, was set to release its first tools for creating data-centric Eclipse imple-

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mentations. According to Skerrett, "If you have an application that has to connect to a number of data sources, the wizards [in the DTP] make it easy to build that app."

The Eclipse Communication Framework has its first set of APIs. The project is intended to simplify the integration of voice over IP and instant messaging capabilities within applications built with RCP.

According to Skerrett, the API implements SIP and Google Talk VoIP protocols; others will follow soon. "This is for productivity. Instead of each developer having to do the connectivity for these protocols, they can incorporate these frameworks into their applications."

An early code release is now available from the PHP IDE Project, which has gained official project status. Led by Zend and with contributions from

IBM and Actuate, the project builds on a commitment by Eclipse to support multiple languages. "This takes Eclipse to the very large PHP community," said Skerrett.

BOARD ELECTIONS

Scott Lewis of Component and Kai-Uwe Maetzel of IBM have been re-elected to the Eclipse board as committer representatives. Newly elected to the

remaining two such posts were IBM's Jeff McAffer, who leads the RCP and Equinox projects, and BEA's Tim Wagner, who serves as lead for the Web Tools Project.

Add-in provider representatives elected to an additional term were Howard Lewis, president and CEO of Discovery

Machine; and Todd Williams of Genuitec. Williams also serves on the WTP project's requirements group and is chairman of the foundation's membership committee. Newly elected were Jochen Krause, Innoopect's managing director; and Mike Taylor, president and CEO of Instantiations. ■

Space-Age Technology To Find Bugs

BY ALEX HANDY

In the never-ending war against bugs, Integrated Software Metrics has enlisted the help of technology pioneered by NASA.

ISM's Predictive Suite is based on the idea that artificial intelligence (AI) can predict where a codebase will become broken before it happens. Predictive's standard use mode will find complexity within source code and highlight troubled areas.

The company recently updated its Predictive Pro AI-based QA tool to version 2.0, and announced its intention to release Predictive Server, a network-based version of the tool.

With the 2.0 release of Predictive Pro and Lite, ISM has added support for both Java and C# to the tool. Previously, the tool supported only C and C++.

Predictive Pro is available now for US\$1,500 per developer seat. Predictive Lite costs \$39.95 and does not include the error collection or the heuristics mode. Predictive Server is scheduled for release in early summer. ■

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News Briefs

MORE UPGRADES

< continued from page 8

tion projects and expanded file type support to find and deliver most types of information on the Web . . . Green Hills Software has announced that its **MULTI** integrated development environment and **Integrity** real-time operating system will support DaVinci technology from Texas Instruments . . . Verio has revealed its **MultiSite** hosting solution for Windows applications. MultiSite lets account owners split the resources of an account for managing multiple independent sites. This lets users perform individual stops and starts, view disk usage by site and edit custom permissions. The company also announced Starter Plan for Windows, for one or two Windows-based Web sites at what the company calls "an affordable cost" . . . **AnthillPro 2.6**, a



build automation server from Urbancode, was released with new compatibility with NAnt and Maven 2.0 builders. AnthillPro 2.6

also allows builds to be pushed to servers for testing, and offers Yahoo IM and RSS-based notification . . . **SOAtest 4.5**, an automated testing tool for verifying all aspects of a Web service, was released by Parasoft. The release empowers governance over the development of Web services and can now automate testing of BPEL-based processes . . . Kapow Technologies has announced the availability of version 6.0 of its **Web Integration Platform**. It can clip different independent and interconnected sections of a Web application and automatically generate a portlet. It also can continuously clip full Web sites and work with frames, pop-ups screens and JavaScript, as well as define HTML elements that should or should not appear in the clip . . . Salesforce.com has introduced **Unlimited Edition**, giving customers

access to a wide range of hosted applications via its AppExchange repository and professional services. Unlimited Edition provides all the features of the Enterprise Edition but adds increased storage per user, the ability to run an unlimited number of applications, a "sandbox" environment for testing and development and a premium support package. Unlimited Edition costs US\$195 per user per month . . . IBM has unveiled **DB2 Data Warehouse Edition 9.1**, its business intelligence platform. The release includes Rational Data Architect, an analytics design and development tool, as well as DB2 Alphablox, a tool for building custom apps from warehouse data. Design Studio, an Eclipse-based environment, now discovers warehouse data and displays the best areas for potential mining . . . **WANdisco** has introduced an eponymous multisite development solution for the Subversion open-source version control system. The company

claims it is the only SCM tool that uses active-active replication to keep work from distributed development teams in sync in real time. The solution, which costs US\$500 per seat, adds complex security capabilities that can keep a repository locked down in some places and wide open in others . . . Altova has released an update to its **Altova UModel 2006** UML modeling tool with support for UML 2.1 and XMI 2.1. It also provides sequence diagrams, C# code generation, reverse engineering and round-trip engineering . . . Appian has announced **Appian Enterprise 5**, its business process management suite with enhancements that include integration with Microsoft Outlook and deeper support for BPMN. It's also now available with an integrated Java Messaging System infrastructure. The company claims the suite includes the industry's only AJAX-based process modeler.



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PEOPLE

Xaware has announced **Tim Harvey** as CEO. Harvey served as SVP of sales and marketing at S1. Prior to that, he served six years with SynQuest as president and COO . . . **Avi Schlank** has been appointed to the position of VP of strategic partner business development for NetManage. Schlank joins the company following six years of business consulting. He also served as the director of product marketing at Wind River Systems . . . Stellant has promoted **Dan Ryan**, EVP of marketing and business development, to COO. He will now oversee the company's research and development, consulting services, training and support groups. ■

Original Software: The Power to Self-Heal

Function tester lets the blind lead the inexperienced

BY ALEX HANDY

Claiming to put application testing in the hands of inexperienced users, Original Software in March debuted Test Drive Gold 1.0, a point-and-click tool that it says can test user interface functionality of Web-based and stand-alone Windows and Java applications.

Test Drive Gold records a user's actions within a GUI, and saves them for automated replay as a functionality test. Recorded tests can be automatically played back later on.

According to Colin Armitage, CEO of Original Software, tests designed in Test Drive Gold can find the appropriate buttons and boxes

by matching the descriptions attached to them that would otherwise be intended for the blind. "We use Microsoft and Java accessibility standards to do this," he said. "We are able to understand the content of the application under test without any plug-ins."

Armitage claimed the tool also can adapt to interface changes as an application is being developed. "If the application changes, as far as is humanly possible, Test Drive Gold will attempt to deal with information being shuffled around the screen and [on] new screens being added," he said. If the program gives up trying, he added, it will prompt the user with some-

thing like: "I give up. You tell me what's happened in this new version."

But the biggest feather in Test Drive Gold's cap, said Armitage, is the complete lack of a need for scripting, which he said enables the tool to be used by just about anyone in an organization. The tool was designed for the novice tester, he added. "If you can't crack dealing with changing applications, no one wants to waste time and money building up test scripts," he asserted. "There is no scripting language at all, not even a little bit, anywhere."

Test Drive Gold is available now for US\$8,000 per concurrent user. ■

Two Parallel Approaches

< continued from page 18

which also on Feb. 27 released Accelerant 3.5, an update to its parallelization API that now supports Java and C# languages. The tool previously supported C/C++, Fortran and Visual Basic for Applications (VBA). The company also offers a version that wraps around application binaries.

"If you have applications that have iterations, we can take that code and run it on multiple boxes or on multiple processors on the same box. We take iterative code and run it in parallel," explained Kurt Ziegler, ASPEED's executive vice president of development. To use the tool, developers annotate iterative code within their Linux or Windows applications. Iterative data is passed to an engine—added at link time—that handles the parceling out of work to connected nodes. "This is an application implementation; there's no server or daemons involved. We turn hard loops into variable loops. Our engine takes control over distribution of the work and learns which machines can take more and less and re-adapts the ranges and moves the data."

Ziegler said the tool saw ear-



There are no servers or daemons involved with Accelerator, says ASPEED's Ziegler.

ly success by improving performance of VBA, the scripting language for Microsoft's Office applications. "Lots of financial institutions use Excel as a GUI and [perform calculations] either in Excel or VBA for extensive calculations they couldn't do in Excel." The problem with the single-threaded VBA is slow performance. "[Accelerator] gives them the ability to effectively run with multithread efficiency without rewriting the code."

He claimed that performance gains are directly related to the number of iterations. "So if you were running four

instances in VBA, you could cut the elapsed runtime to one-quarter of its original time." The same holds true for other languages, he claimed. "With an app server, you're locked into the JVM in which the service is executing, and it's seen as single-threaded. With ours, we can launch additional JVMs or CLIs as needed. Conceptually, you have parallelized your code without having to think about anything."

For parallel computing, the host system passes additional instances of the accelerated app to other connected nodes, which then execute it and pass its iterative data back to the host engine.

"Nothing special has to run on the other boxes. The engines communicate with each other, move data and deal with stalls and failures. This is purely an application additive; there are no infrastructure dependencies, grid [or] server, and there are no remnants leftover afterwards," he said.

Accelerant 3.5 pricing starts at US\$25,000 for 25 concurrent instances in production. Developers may create an unlimited number of additional instances for testing; additional instances can be put into production for \$1,000 each. ■

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Artisan Suite Builds on SysML Specification

BY DAVID RUBINSTEIN

The advancement of the SysML specification for system design through Object Management Group's standards process has led Artisan Software to release version 6.1 of its Studio modeling tools and repository, which support most aspects of the specification.

The draft version of SysML, now available for review at syseng.omg.org/SysML.htm, consists of two competing submissions that were merged in February. A final revision will be made to the spec on April 3, according to Andrew Watson, OMG's vice president and technical director. "It's for large, complex one-off systems such as oil refineries or design integration for motorcars," he said.

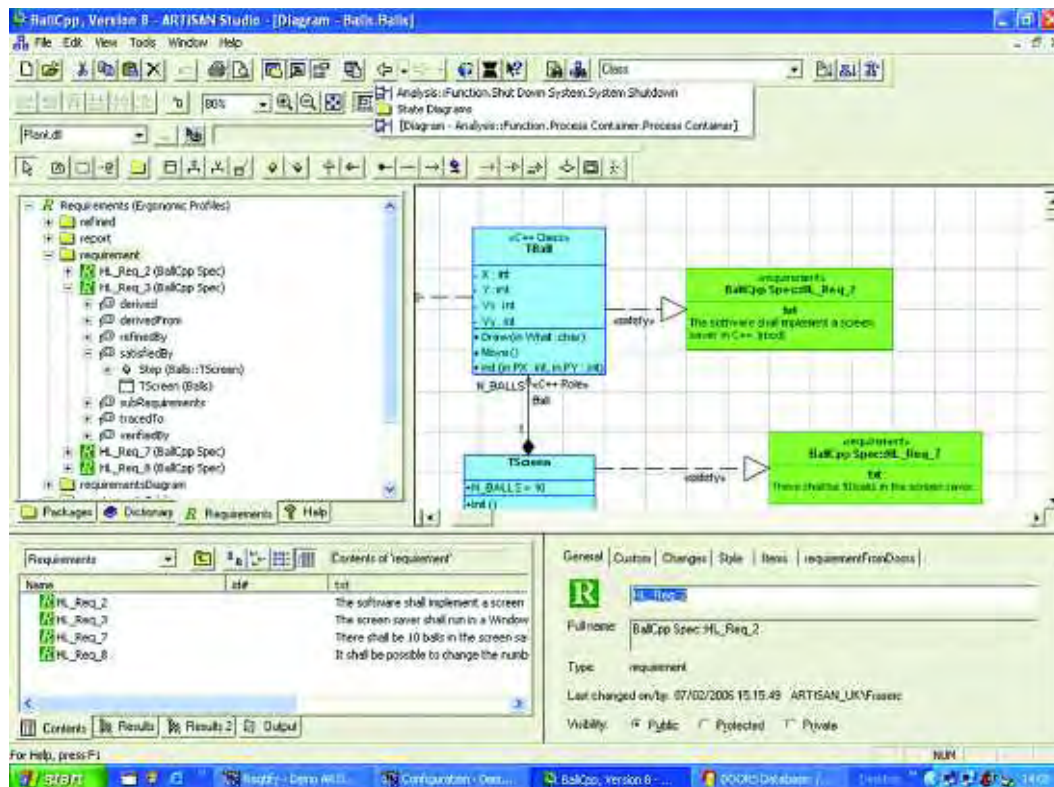
While UML is targeted at software engineers, SysML is designed for the definition of systems, said Alan Moore, vice president of product strategy at Artisan and a member of the SysML working group. He did indicate that organizations probably would use SysML only for projects in which they also expected to be doing software development later on. Moore cited an instance in which a framework such as the Department of Defense's Architecture

Framework (DoDAF) is used to gain an operational view of a project before SysML is used to define a system, and then UML is used to create the software that would run on that system.

Moore said he expects the final spec from OMG at the end of this year or early next. Military, aerospace, automotive and industrial automation are areas in which SysML is expected to gain widespread acceptance, he said. The suite supports numerous process standards in those fields, including DO178B and others for safety-critical apps.

One of the things SysML enables is the modeling of requirements, and Artisan Studio 6.1 has been updated with that support, Moore said. The suite provides a bridge between Studio and Telelogic's requirements management environment DOORS, so requirements written in DOORS can be pulled into Studio as SysML requirements. Studio also ties into IBM Rational's Requisite Pro, and Word and Excel, Moore noted.

The SysML working group is interested in tracing requirements through the system design and then into the software design. "Showing that a design matches requirements is a black art," Moore said. "The



Artisan Studio 6.1 incorporates aspects of the latest draft version of SysML for designing large, complex systems.

SysML requirements profile begins to address that issue."

A code generation feature in Studio 6.1 comes in two schemes: on-demand code synchronization, which lets the user choose when code should be generated from the model (or a model updated from a change to the code); and automatic code

synchronization, which keeps the model and code in lockstep, Moore said. The latter option, he said, is for people doing a more iterative style of development.

The Artisan suite also provides template schemas for generating code for different targets, which enables reuse of models, patterns and code

transformations across multiple projects, Moore said. Currently, there are templates for Win32 and Wind River's VxWorks platforms; Enea's OSE real-time operating system is likely the next target, Moore said. A template developer kit lets users modify the templates and regenerate all the DLL files necessary to run under the modification, he added.

Also new to Studio 6.1 is the ability to branch a model using repository-based configuration management functionality. "This [internal versioning] allows people to do private work and then add it back into the trunk when it's mature enough to let others see," Moore said. All versions can be kept consistent in a private sandbox, and when that work is reconciled back into the trunk, it becomes consistent as well, he added. Configuration management tools enable branching, but only of files. The difficulty comes in partitioning models into files to allow a number of users to work simultaneously. "Model files have a bird's nest of dependencies that CM tools don't track. There's a strong chance for version skew."

Other enhancements include new tools for fine-tuning diagrams and for navigation, better support for Active Directory and for migrating models to IBM Rational's XDE modeling environment. ■

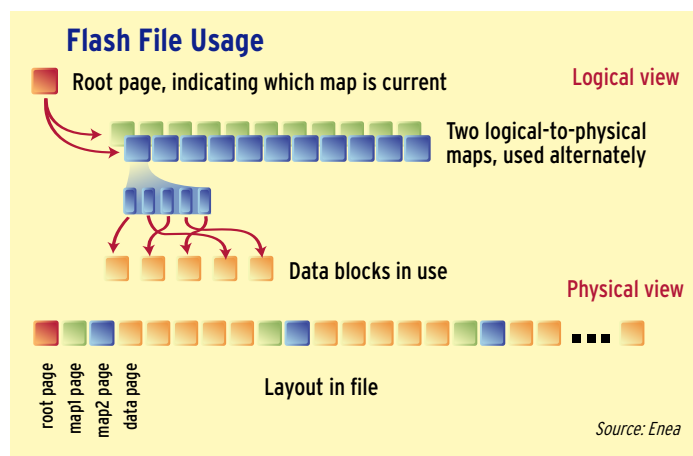
In a Flash, Polyhedra Has a Cell Phone Side

BY EDWARD J. CORREIA

For years, Enea's Polyhedra RDBMS has been quietly storing router tables, sensor readings and other persistent and transient data within devices the world over. On March 6, the company released Polyhedra FlashLite, a version of its small-footprint database that can reside in and store to flash memory, making it suitable for cell phones and other cost-sensitive handheld devices.

"We ripped out the journaling and fault tolerance mechanisms and made the code more modular," said Nigel Day, product marketing manager for Polyhedra. "It's the same database as before but targets the marketplace where RAM is more expensive and uses more battery life."

The major difference in the flash version, he said, is in the way its ACID-compliant fault



To maintain ACID compliance without journaling, FlashLite uses logical-to-physical alternate-page mapping.

tolerance mechanisms are implemented. "Rather than using a log file, we make sure that all info is preserved using a logical-to-physical page map, and [we] have two copies that are used by alternate transactions until we write the final byte. So if anything fails during

a transition, the previous state is still there."

Polyhedra FlashLite typically can reside in less than 1MB of memory, or in as little as 200KB. In addition, Day claimed that flash-based Polyhedra can achieve faster data access performance than the standard edition.

Both high-speed NOR and low-cost NAND flash types are supported. The one major limitation of FlashLite compared with the standard edition is in persistence handling. The standard edition allows a field to be characterized as transient, as might be appropriate for capturing continuously changing data from a sensor, for example. "This allows a developer to say, 'Don't bother logging transactions marked as transient.'" Due to slower write rates of flash memory, FlashLite does not support transient data.

According to Day, databases written for the standard edition will run unchanged on Polyhedra FlashLite; all versions share a common API. The product, which costs US\$11,995 per developer seat, is available in 32- and 64-bit versions and runs on Integrity, Linux, OSE, Unix, VxWorks and Windows. ■

Sun Spots Future Developers With Bare-Metal JVM

BY EDWARD J. CORREIA

"Look, ma, no operating system!" Such could be the cry of young developers of the future if the Java vision of Sun Microsystems comes to fruition. Striding toward that vision, the company in May is set to release a hardware and software development kit for Small Programmable Object Technology (SPOT), tools released in March that include a CLDC JVM that runs directly on the processor.

The development kit will include two palm-sized Sun SPOT probes and a base station, all battery-operated. According to specifications published by Sun, the three devices each will include an ARM9 processor, 512KB RAM, 4MB flash, 2.4 GHz 802.15.4 radio with integrated antenna, 3.6V lithium-ion battery and a USB interface.

The stand-alone probes add a three-axis accelerometer (for measuring multidirectional acceleration), temperature and light sensors, eight tricolor LEDs, six analog inputs and eight general-purpose I/O pins (for controlling relays, stepper motors, servos and the like). Probes wired to a PC via USB also can act as a base station.

Software included with the kit will be the NetBeans 5.0 development environment and the Squawk Java Virtual Machine, a flash-resident CLDC 1.1 JVM developed at Sun Labs under the direction of Glenn Edens, a Sun senior vice president. "This will allow Java, as it did with cell phones and the Internet, to play a pivotal role in enabling the coming wave of sensor-driven computing," he said in a statement announcing the Sun SPOT release.

Sun researchers began working on wireless sensor networks in 2003. During the first year, according to reports published by Sun, they began to realize that more powerful and easily programmable processors were needed. The Sun SPOT project, which was first announced in April 2004, included the hardware development and its integration with the small, flexible Squawk JVM also being developed in the labs.

Applications expected to

emerge as a result of the technology include wireless sensor networks for climate control in buildings, quality control in manufacturing plants, patient safety in health-care settings,

tracking fertilizer runoff for farmers, and countless military applications.

Obstacles to adoption, according to Sun, include data security within the resource

constraints of the probes, processor limitations for signal analysis and control, and the absence of tools to efficiently program, monitor and manage the devices.

The kit is expected to cost about US\$499 and is being marketed initially to researchers, hobbyists and academia. A Web site dedicated to the technology is at www.sunspotworld.com. ■

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A Picture Of Business Integration

BY CAROL WEISZMANN
AND SUSAN MESSENHEIMER

Business integration is the culmination of successful data and/or application integration,” said Jerry Bartlett, chief information officer at Ameritrade.

But too often, noted Jeff Ryan, enterprise architect at The Hartford Financial Services Group, integration solutions are chosen before there’s been a clear articulation of integration requirements.

How, then, should developers and enterprise architects approach a business integration project?

What kind of integration do I need?

“You’ve got to begin by understanding the general nature of the problem and the outcome you’re looking to achieve,” advised Bartlett. “Is it purely an efficiency problem? If so, focus on the applications and the associated processes utilized. The solution may be as simple as tying several applications together to reduce duplication and rework.

“If,” Bartlett continued, “the problem is that different business units are getting different versions of the ‘truth’ [metrics and financials, for example],

then the focus needs to begin with the data sources—how are they being populated, and which applications are using the various data sources? Business leaders must be engaged in order to determine the correct version of the truth.”

The requirements of a business integration project must address an assortment of capabilities, ranging from business functionality to runtime qualities such as expected volumes, response time and number of concurrent transactions, to development time qualities, including the volatility of the integration interface. Additional considerations include budget, resources, time frames, existing skill sets, strategic versus tactical concerns, anticipated reuse and so on.

“A thoughtful architecture,” said The Hartford’s Ryan, “will include blueprints and road maps that provide a portfolio view and anticipate rather than react to the integration needs of projects.” At The Hartford, business integration is the rule rather than the exception.

Once project requirements have been delineated, they need to be aligned with the appropriate integration domains or layers.

“Think very hard about whether integration is really necessary,” said Guido Sacchi, chief information officer and executive director of shared services at CompuCredit, where an innovative project called XML Gateway pioneers Web services and makes access to external data

sources transparent to client applications.

“Interoperability may be all that’s needed,” he said. “Interoperability is cheaper and faster than integration, and today’s solutions for interoperability are robust and reliable.”

Key is asking the right questions.

Rhonda Ross, IS specialist at insurance software firm Mitchell International, said organizations need to know who will need access to the information, what specific data they will be using, how they will be interacting with it (read only or read/write), and when this will be occurring (throughout the day or just for monthly reporting, for example).

Mitchell International has used Above All Software’s Composite Application Platform to integrate its sales force automation system (salesforce.com), customer support application (Remedy) and custom legacy billing solution (called Universe CIS) into a new composite app deployed within the salesforce.com user interface. Now Mitchell International’s sales team can interact with a complete customer profile, enabling them to be more responsive and effective.



***‘That’s what it’s all about—
solving problems and
adding business value.’***

—Jeff Ryan, enterprise architect at
The Hartford Financial Services Group



Examining the Nature Of the Business Integration Beast

BY CAROL WEISZMANN
AND SUSAN MESSENHEIMER

Business integration requirements are typically presented in a couple of ways, reported Jeff Ryan, enterprise architect at The Hartford Financial Services Group.

"One is a storyboard picture of a user interface comprising functionality from disparate applications," he said. "Another is a napkin drawing showing desired interactions between applications."

As Ryan sees it, the architect's job is first to understand these requirements, then match them to the integration domain(s) where they can be addressed most effectively. Setting aside the details of varying viewpoints, these domains, or integration layers, include:

- **Data integration**, focusing on sharing single-source data among multiple applications, or synchronizing data transactions among multiple heterogeneous databases and relying on transaction management and data access components as key elements. Real-time data integration targets real-time distributed databases and data replication for throughput, high availability and disaster recovery purposes. Analytic data integration encompasses batch processes such as extract-transform-load (ETL) for data warehousing, reporting and online analytical processing (OLAP) purposes.

- **Presentation integration**, involving creation of a new user interface that provides access to more than one legacy application, aggregating such desktop functionality as portals and screen scraping. This is accomplished via the interaction of new integration logic with the application programming interface or presentation components of the legacy applications.

- **Application integration**, allowing one application to invoke the functions of another application, hiding application functionality behind abstract interfaces. Middleware that delivers interface definition, communications standards and runtime support provides robust means

of achieving functional integration.

- **Web services integration**, tackling the exchange of data on large private enterprise networks or over the public Internet via standard-based application integration. Effectively architected Web services integration enables applications to provide and consume services at a functional and/or data level, resulting in a flexibility and robustness unmatched by proprietary closed systems.

- **Business process integration**, dealing with long-running transactions made up of sequences of events, triggers and human interaction.

But one size does not fit all. "The level and type of integration appropriate to one problem," said Jim Lupton, vice president and director of systems management in ISD at American Fidelity Assurance Company, "may not be so useful for the next problem."

INTEGRATION AND SOA

From a technical perspective, observed Eric Roch, national practice director of business integration at consultant (and

IBM business partner) Perficient, integration problems occur when assembling legacy IT assets as components within a service-oriented architecture (SOA), which is the current state of the art for integration efforts.

Why SOA?

"If you use a data integration approach, you're moving whole chunks of data from one system to another," said Sanjay Sarathy, vice president of marketing at Above All Software. The drawbacks: difficult data integrity and synchronization issues, trouble supporting real-time requirements, and a spaghetti-works set of links when more than

two apps are integrated.

Meanwhile, enterprise application integration (EAI) has been expensive, code-intensive, intrusive and—because business requirements change and integration needs change with them—ineffective, Sarathy observed. "The connec-

A single integration approach, Ross noted, may not be the best solution. "A hybrid that combines some data integration along with other types of integration could be ideal," she suggested.

The Hartford's initiatives, for instance, include many large programs and projects, such as its ICON 2.0 small-agency submission tool, implementing both presentation integration and application integration to enable agencies to better serve small business clients.

STARTING WITH THE BUSINESS

The Hartford's Ryan recommends having a predetermined strategy that aligns its portfolio of initiatives to the several types of integration domains or layers. "Project needs are the first driver," he affirmed.

"Start with understanding the business problem that needs to be solved," counseled Ameritrade's Bartlett. "That's what it's all about—solving business problems and adding business value."

Mitchell International's Ross articulates some of the questions that need to be asked:

What are the specific opportunities

or threats that your enterprise is facing?

What strategy is best for handling them?

What approach will deliver the best return on investment?

The answers, she emphasized, will be different for every business. "A company like ours that has been in business for 60 years would start in a different place than a less mature organization," she said. "A company that is global and/or has been through a series of mergers and acquisitions would be facing different challenges than one operating in a single country and with a limited number of systems."

Jim Lupton, vice president and director of systems management in ISD at American Fidelity Assurance Company, believes, "First, the business needs to determine the functionality to be shared across applications and the level of data integration required."

This should be based on current and anticipated business processes and data needs. Picking a specific technical starting point should be driven by these busi-

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'The level and type of integration appropriate to one problem may not be so useful for the next problem.'

—Jim Lupton, vice president
at American Fidelity
Assurance Company

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A Picture of Business Integration

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ness requirements.

"Next," Lupton said, "both the high-level business functionality to be shared across applications and the infrastructure ser-

vices necessary to accomplish that level of integration should be defined. Selection of a specific application or legacy system for integration should be deferred until the necessary

framework, methods, patterns and policies are in place."

AN UNDERLYING STRATEGY

"My recommendation," said CompuCredit's Sacchi, "is to

solve the problem from an architecture standpoint: At which integration layer can the problem at hand best be solved? In my view, service-oriented architecture [SOA] pro-

vides the best trade-off of integration and interoperability."

American Fidelity's Lupton agreed. "Regardless of the strategy selected, emphasis should be placed on loose coupling, component-based integration, and use of an integration services framework."

Those undertaking business integration projects using an SOA/Web services strategy do so because of the business value they derive from this approach, according to Sacchi and Lupton.

"From the business perspective," said Eric Roch, national practice director of business integration at consultant Perficient, "SOA in general can provide benefits such as supply chain optimization and trading partner integration."

To that end, he counseled, "an enterprise should build a services blueprint based on projects in the IT portfolio and business drivers. Funded projects in the IT portfolio should be examined to determine if integration software will reduce costs and create business value."

Such a services blueprint—business-driven, so any architecture it defines supports business objectives—acts as a road map for rolling out SOA-based integration. "The road map identifies the level of integration needed by defining the architecture required to support its projects," said Roch.


INTEGRATION PITFALLS


"The single biggest risk is to undertake an initiative without understanding the business problem and the desired outcome," warned Ameritrade's Bartlett. "Without that understanding, the technology group will likely not meet major expectations and, as a result, will be viewed as a failure—once again not meeting the business' needs."

American Fidelity's Lupton cautioned against direct coupling of applications. "It's complex, brittle and inflexible," he argued. "Tight coupling, chaotic [or nonexistent] architecture, inefficient application interactions, and inefficient data storage and management can be avoided with a carefully thought-out and implemented integration architecture that's solidly based on present and future business needs."

The Hartford's Ryan cited the dangers of "a one-off project approach resulting in a

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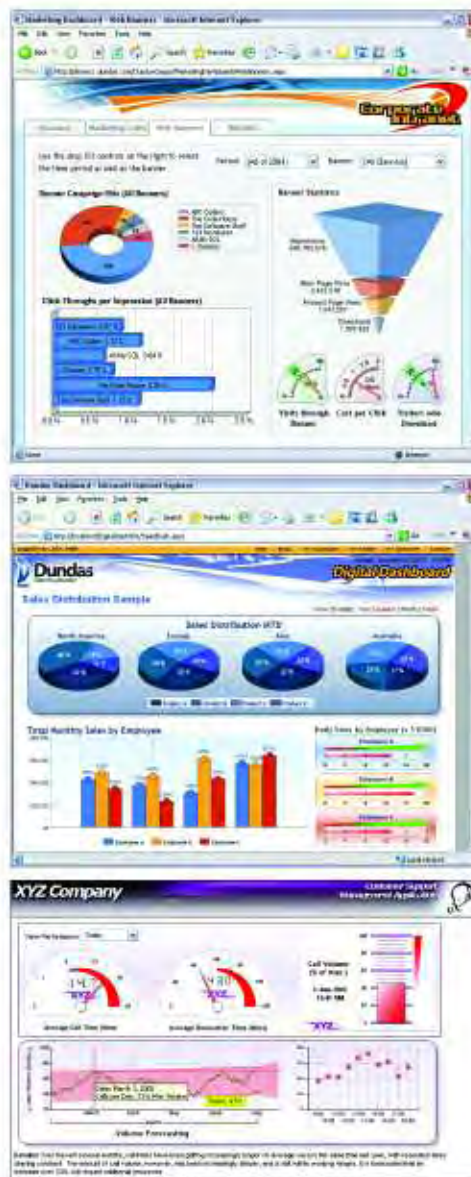
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Examining the Nature of the Business Integration Beast

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tion points between applications become as tough as concrete," he said, "so in many cases, you're better off starting over than attempting to modify it."

SOA, or Web services, on the other hand, enables assembly of composite applications, pulling together all the necessary functionality into an integrated, interactive solution. "And the composite app can be deployed within the user interface of an existing application that users are already familiar with," Sarathy said.

Rhonda Ross, IS specialist at insurance software firm Mitchell International, concurred. "With data integration, raw data is physically moved from one application into another, leaving all of the business rules related to that data behind," she said. "In contrast, with application and Web services integration, it's possible to reuse the data without having to replicate it and physically move it between applications."

In addition, she noted, the integrity of the data can be assured because the same business rules are enforced in all applications using the data.

A Picture of Business Integration

◀ continued from page 30

'spaghetti bowl' of integration solutions and a 'junk drawer' of services."

Observed Ross of Mitchell International: "Integration projects often take on a life of their own and grow into projects so complex that by the time a solution is delivered, business needs have changed."

She proposed breaking a business integration project into small parts that can be delivered quickly and provide immediate benefits to the user community. This builds support for the next segment of a multi-phased project plan.

Ross also offered advice about development tools: "Select tools that are easy to use and can be utilized by analysts as well as developers. This increases the speed with which solutions can be delivered and improves the probability of providing solutions that best meet users' needs." ■

SOA, said Perficient's Roch, "is where you have technical point solutions, such as main-frame and data integration." He pointed to those SOA software vendors emerging from the EAI space as well as the application

server vendors (such as IBM and BEA) building SOA integration into their app server stack.

The result, Roch concluded, is that EAI vendors and application server vendors have created an integration software stack.

"These software stacks can be compared," he suggested, "based on an integration software reference architecture that includes such components as portals (which consume services and present them to the

user), data integration tools (such as ETL), business process management and messaging. The tools a business will need from the stack depend on the integration problems it must solve to create its SOA." ■

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EDITORIALS

Pay Attention to Builds

Few areas of enterprise development have as much trouble scaling as builds. For individual developers or small teams, the process is quite straightforward, either using tools built into most modern IDEs or working with a software configuration management system to conduct an automated build.

However, when the project or team gets large, the builds become difficult and time-consuming. There's more involved than simply handling a massive codebase with many source files and artifacts by implementing incremental builds and parallel processing. How do you share source code between complex, overlapping product lines? What about sharing build reports back through a huge team of architects, coders and testers? Is there a way to allow for experimentation, refactoring and temporary forking without affecting the main line? What about moving faster than nightly builds?

Over the past few years, a number of companies have tackled the challenges inherent in large-scale software builds. Working with the major integrated development environments and SCM systems, they keep pushing the bar forward by improving performance, adding flexibility and enabling greater productivity.

Recently, for example, Catalyst Systems moved its Openmake software forward with full scriptless builds—addressing a long-standing problem with writing and maintaining complex scripts. With small teams, it's not a problem. For huge enterprise projects, it's a big problem.

BuildForge is tackling other tough problems with new products that tie build management into security systems, automated target-platform discovery and tighter IDE integration. By helping developers "sandbox" check-ins to SCM systems, problems can be found quicker, and addressed quicker, than with those nightly builds.

While build management isn't as sexy or exciting to most developers as, say, new language extensions or cool new IDE plug-ins, they can make the difference between delivering software on time, and failing to keep up with complexity. If you haven't looked at modern build tools recently, it's time to do so.

Getting the (Instant) Message

If developers want to understand the challenges of using technologies created by vendors, they need look no further than instant messaging. Built by companies like AOL, MSN and Yahoo to serve subscribers to their own networks, the instant messaging protocols and networks have been closed, closed, closed. Customers may complain, but with few exceptions, those complaints have fallen on deaf ears. Access to the networks, and their APIs, has remained closed, and standards are nonexistent.

With AOL's recent moves to open up its AIM platform to third-party developers, this may be changing. Instant messaging offers many opportunities to enterprise and commercial developers alike: Wouldn't it be nice if your build management system could use instant messages to tell you when the nightly build broke?

The applications are clear and compelling. Kudos to AOL for making the first move. Let's see if MSN and Yahoo reciprocate, or if they'll be left behind by a more open, competitive environment. ■

Software Development:
A Core Competency?

Is writing software core to a software company's success? If that sounds like a trick question, it's definitely not a trick. Understanding what really impacts a company's success is a very serious topic that many software executives take for granted, and thus don't question the fundamental underlying assumptions.

More than a quarter of a century since the introduction of the personal computer, the software industry has matured and the tectonic plates of the software market are shifting—"India and China" are the fault lines that concern residents of Silicon Valley much more than "San Andreas." So what happened and what does it mean to you and me?

The economics of the software industry have changed dramatically. Top line revenues are growing modestly, but margins are slipping due to the shift toward services and the downward pressure of new development paradigms (open source) and delivery models (software as a service). ISV financial performance is drawing more scrutiny from Wall Street—increasingly, valuations are based on profitability and growth, not license revenue. And the Street provides no premiums for who, how or where software is produced—maybe the opposite.

Last year, New York Times columnist Thomas Friedman explained the impact of globalization in "The World Is Flat." This year, Geoffrey Moore, in "Dealing with Darwin: How Great Companies Innovate at Every Phase of their Evolution," will tell us that economic Darwinism will rule the day. In today's marketplace, the winners will be those with not just innovative ideas but also the capability to out-execute competitors in bringing superior sales and marketing strategies to life.

Product innovation alone will no longer be the unconditional tail wagging the dog—R&D performance and operational excellence are increasingly important. Today, the core work of software companies is anticipating and meeting customer needs (ideation and distribution) not building, maintaining and

servicing products.

This thought process is not second nature for software companies that have long worshipped at the shrine of technology and developers above all else. Why is it that only 20 percent of a product's functionality typically represents 80 percent of the business value for customers, but we don't run our businesses this way? R&D leaders are going to have to redefine which parts of their operations are "core" to success and which are "context."

Software product development work is already flowing offshore in much the same way as high-end manufacturing and electronics did. Think Dell. Software leaders can do what Dell did, but it will require a global context for outsourcing product development, a relentless focus on quality, innovation that directly benefits customers, and faster and more flexible cycles of bringing products to market.

Complicating the picture is the changing face of the competition. Most companies compare themselves with industry peers. But with the pace of industry consolidation, competition increasingly comes from the megabrands (think Microsoft, Oracle and SAP) that have achieved significant economies of scale and learned to leverage a global operating model. And a new competitor is looming—software companies out of India and China with very low cost structures. They will offer products similar to yours at substantially lower prices.

OPTIMIZING PERFORMANCE

So what does this mean for the future of the R&D organization? What should a global R&D organization look like? Offshore development is an indisputable trend enabling software companies to better balance core- and context-focused work and helping to optimize R&D performance.

Optimizing R&D performance means getting the best possible output from your resources, deploying them for

maximum leverage and matching this configuration to your business objectives. Companies that are performing well and proactively embracing globalization find that rather than mass layoffs, they increase the overall size of the development organization, along with improving capacity,

Gordon Brooks



quality and time-to-market. For them it's about freeing up onshore resources to focus on the core. Let me be specific about what this could mean.

Rebalance your "innovation" budget: If you analyze the R&D budgets of mature software vendors, you'll find that only 5 percent to 10 percent of R&D is spent on innovation—the rest is spent on adding features to current products in order to keep current clients on board. That's just not enough to fundamentally change your competitive position. Where will your next big thing come from? You need to free up bandwidth to better balance R&D spending between today's products and those that will keep you healthy tomorrow.

Recapture services revenues at increased margins: Today software services are like car radios—many manufacturers throw them in for free and lose money. This has led to US\$1 billion of software services for every \$100 million of software sold—most flowing to services companies. Integrators approach 45 percent to 60 percent gross margins, while many software vendors hit only 20 percent to 30 percent. To shift from a necessary evil to a growth part of your business model, you need to hit at least a 50 percent gross margin.

Much of this work does not require onshore presence. An 80/20-offshore/onshore mix can help boost margins while increasing revenues. Obviously, you need a well-planned approach that expands your overall ecosystem rather than alienating systems integrators. At the end of the day, your professional services organization gets bigger providing another avenue to retain developers who might otherwise have seen their job go off-

shore. And don't underestimate the advantage that managers who can operate effectively in globally distributed environments will have in the job market.

Re-evaluate your product development outsourcing goal: If you've got x people offshore building products and y people in other more expensive areas doing the same thing, but you don't have a road map and end goal, you really don't have an offshore strategy. What are you trying to achieve? What is the right mix? You may be experimenting with how "follow the sun" really works or handing off things like QA & test to an offshore team. The question you should ask is: How do my offshore resources directly contribute to more effective building, maintaining and servicing of my products? Many experts say that vendors should have 70 percent of their product development life cycle offshore.

Further, while outsourcing used to be just about cost, today it's about value—productivity, quality, time-to-market and predictability of execution. To achieve this, you must think in terms of seamless multishore development—true collaboration between your teams and the best, most cost-effective talent wherever it is in the world. And it must be done at scale. Having 10 percent to 20 percent of your staff offshore may feel less risky, but it won't move the needle and probably isn't worth the effort. Competitive conditions have made the days of putting your toe into the water obsolete.

CONNECT TO GLOBAL TALENT

It may seem like a strange concept, but building, maintaining and servicing products are now mostly context for software companies. One way to shift resources to better focus on the core is to connect to the wealth of global talent and process excellence available today. This will allow you to focus on winning in the market—freeing up bandwidth and collapsing cycle times to counter slowing growth, the proliferation of delivery options and customer demands for customization. As in any maturing industry, those who do not evolve will be left behind. ■

Gordon Brooks is president and CEO of Symphony Services, which assists outsourcing projects with software design, development, cost management and analytics.

OPEN IS BETTER

In Andrew Binstock's column "The Great Database Give-away" [March 1, page 35], he makes a fundamental error regarding the licensing requirements of MySQL.

He states that: "MySQL is free only if the developed software is made available under the GNU General Public License or a similar license. Use it in-house or as an ISV? You gotta pay."

From MySQL's own licensing FAQ: "The Open Source License allows you to use the software at no charge under the condition that if you use MySQL in an application you redistribute, the complete source code for your application must be available and freely redistributable under reasonable conditions."

The key words are "if you use MySQL in an application you redistribute." This means that in-house deployments have no requirement to pay. Even an ISV can redistribute MySQL with its own application as long as the ISV opens its own code.

While I do agree that it is an excellent price for an excellent product, the value added by professional support is a better reason for an in-house project to purchase MySQL rather than uncertainty about the licensing requirements.

I normally enjoy Mr. Binstock's columns, but these comments leave me wondering if this was a glossing over of the details, or if Mr. Binstock him-

self does not understand the implications of open-source licensing—you know, the whole "free as in speech and liberty, not free as in beer." Open-source "free" is not the opposite of "commercial."

As one who comments on quite a few open-source products, I would encourage your publication to check facts like this, as there is enough FUD out there as it is about licensing, patents and TCO.

Finally, Mr. Binstock states that in MySQL, as with other "Express" database products, "the attraction is the price, not the code." While I agree with this in principle, I think companies are increasingly recognizing the value of having access to the source. Database applications are some of the most mission-critical a business might deploy. Knowing that—if their database vendor goes out of business or will not fix a critical bug—they have source in hand is becoming a more important decision point as time goes on.

Nick Protokowicz

Greenlight Systems LLC

Andrew Binstock responds: Thank you for your letter. However, you need to read MySQL's license attentively. The license specifically states: "For OEM's, ISVs, corporate, and government users, a commercial license is the proper solution because it provides you with assurance from the vendor and releases you from the strict requirements of the

GPL license." In other words, if you're using it in-house, you must GPL your code, otherwise you have to buy a commercial license—which is exactly what I wrote.

ADA FOR MULTICORE

The parallel programming article ["The Race Is On to Debug Dual-Core Deadlocks," Feb. 1, page 1] failed to mention the only language that I have ever used, which includes tasking and concurrency built into the syntax of the language.

Ada95 provides all the tools necessary to build applications that can run across multiple virtual or actual processors.

It also provides object-oriented implementation features, strong typing and runtime bounds checks.

Maybe with the move toward concurrent processing and the desire to have readable, maintainable, robust, stable large-scale applications, Ada95 will be pursued by more developers.

Dan Dougherty

B-1B AFS C&D Software Lead

WHAT DO YOU THINK?

SD Times welcomes feedback. Letters should include the writer's name, company affiliation and contact information. Letters become the property of BZ Media and may be edited for space and style.

Send your thoughts to feedback@bzmedia.com.

Windows Servers Outpace Unix; Linux Continues to Gain

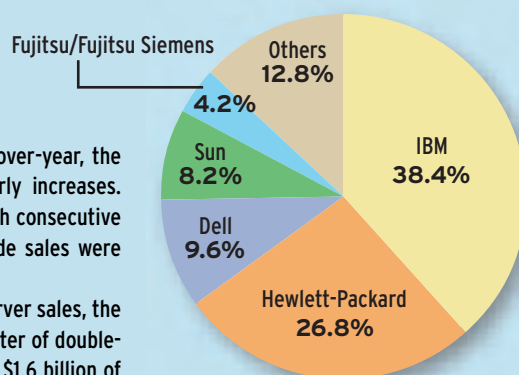
Windows server sales for the first time have outpaced Unix systems, and represented more than one-third of all sales for the fourth quarter of 2005, according to a report released in February by IDC.

The report, IDC's Worldwide Quarterly Server Tracker, also showed a decline in revenue for midrange enterprise servers of 11.5 percent year-over-year, the first such decline after four consecutive quarterly increases. High-end enterprise server revenue fell for the fifth consecutive quarter, and by 1.7 percent for the year. Worldwide sales were down 0.2 percent to US\$14.5 billion for the year.

Linux continues its meteoric rise in terms of server sales, the IDC data showed, posting its 14th consecutive quarter of double-digit revenue growth. Linux servers accounted for \$1.6 billion of the quarter's total revenues, an increase of 20.8 percent from the year-ago period.

DATA WATCH

Worldwide Market Share Major Server Vendors



Source: IDC

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The Black Box of SOA

Now that service-oriented architectures are really taking off, the first reports of serious problems are starting to drift in. Not surprisingly, the challenges of SOA are proving that the happy picture of loosely coupled systems communicating over standard protocols hides tremendous complexity. The two key issues—development and management—are driving managers nutty.

Let's start with development. There are very few tools today that cater to the needs of SOA and Web services development. I am not here referring to design tools, of which there are many—albeit not terribly useful. Rather, I am thinking of true development products. At every step—coding, debugging, implementation—the unique aspects of Web services are poorly supported.

Take, for example, coding. Even today there are promoters of Visual Studio and other tools who still delight in pointing out that a single line of code can transform a function into a Web service. This unreasonable trivialization of the difficulty of writing Web services clouds the issue and makes the problems far more difficult for managers to appreciate.

Really, saying you can write Web services by sticking a function between qualifying statements is like calling a cel-

ery stalk a sandwich because you've placed it between two slices of bread. It's the content that makes the sandwich, and not the other way around.

These functions must be designed and implemented from the get-go as stateless entities whose design anticipates and accommodates future changes in such ways that the need for signature modification is greatly minimized. Services are much like reusable objects and components in this sense. And while no one doubts how difficult it is to write reusable classes and components, this same perspective is still not yet applied to Web services.

The challenge is, in fact, greater with Web services due to the coarser level of granularity. Rather than small, atomic functions (compare two strings), whose interface can be worked out in comparative isolation, Web services not only must integrate with the current needs of the SOA, but also must anticipate how things will change. The need to anticipate and preclude change at the signature level must be deeply respected for fear of falling into Web services hell—where there are thousands of services that are all slightly different due to the evolution of the archi-

tect's understanding of business needs.

Debugging is another neglected problem. With monolithic programs, you can step through code, review the calling stack and do all kinds of things to find out why a value is incorrect. In SOA, the error often occurs on a remote system, possibly even a system several hops away from the service interface you're accessing. Debugging now requires capture of a tremendous amount of state information and visibility into remote systems. And that visibility often entails the participation of developers working on those systems to help track down the problem. Oh, joy!

One company that is addressing some of these issues is Mindreef, developer of the widely admired SOAPscope Web services testing and diagnostic software. Its recently released Coral development platform attacks many of these development issues head-on. It's definitely worth evaluating for nearly all shops working SOA.

There is an additional problem, though, that Mindreef does not address. How do you know what a Web service does behind that signature? Putting aside the trivial examples, Web services in IT can be segregated into two broad

categories: data fetching and transformation and decision services. The latter category refers to services that, for example, accept a mortgage application and return a yes/no decision or other evaluation result.

Often, these services are highly complex and rule-based. The question is, how does the owner of the service know what it does exactly? Likely, he or she can't know the details without consulting the developer. So then, how is this service properly described in a directory? Moreover, how are updates to the inner workings handled, and how are those changes reflected in directory entries?

What you frequently find behind the signature of a decision service is a black box. Without consideration of how the functionality can be communicated, managers of SOA will soon find themselves managing farms of black boxes. And figuring which service does what and which black box needs to be modified will prove to be a daunting challenge.

In this regard, some vendors of rules-based systems, such as ILOG, are designing ways to provide transparency to decision services, but their efforts can only go so far. Web services in SOA need to be thought through far more carefully than they have been if they are to be at all manageable once implemented. ■

Andrew Binstock is the principal analyst at Pacific Data Works.

Integration Watch



Andrew Binstock

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Effective Java™ Reloaded

Joshua Bloch, *Google, Inc.*

It has been five years since *Effective Java™* was released. The Java platform has evolved, and we've learned more about how to use it to best effect. Therefore, a second edition of *Effective Java™* is being released to coincide with the 2006 JavaOne conference. This presentation covers new material that has been added to the second edition, material that should be useful to every working Java technology programmer.

Spring Framework Update

Rod Johnson, *Interface21*

Rod Johnson, the father of Spring, brings attendees up to date on some of the many significant new features in the Spring 1.3 and 1.4 releases. He discusses what's new and cool in the Spring world and examines the implications of these new features for best practice in developing applications with the Spring Framework. Johnson shows code examples throughout the presentation, leaving attendees ready to try these features out for themselves.

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The End of the World as We Know It

REDMOND, April 1, 2006—Microsoft Corp. (MSFT) announced today that it will retire its Windows operating system in early 2007.

"I just bought one of the new Apple MacBook Pro notebooks," said Bill Gates, Microsoft chairman and chief software architect, "and it's a great machine. I was impressed by the quality of the UI and the stability of the platform—much better than anything we've ever done."

"I just had a Windows device driver fail the other day and lock up my Windows XP Professional laptop," Gates continued. "Nothing like that seems to happen on my new Apple machine under Mac OS X 10.4. I even have a Unix command line when I need to do real work."

"Now that the Mac is Intel-based," added Gates, "it's a trivial matter to run legacy Windows applications on the Mac using a virtual-machine-style product. So, of course we'll buy VMware and shut it down," he said. "But in the long term, why even bother making an inferior product like Windows? We'll just port everything to the Mac."

Gates went on to say, "When I looked at what was involved in the porting process, I was shocked to learn that our developers were using proprietary dialects like C# and Visual Basic. These programs can't run on any operating system except

Windows! What were my developers thinking? We tell our customers to use this junk, of course, otherwise they might be tempted to go with that open-source stuff, or with another platform, but I never thought for a minute that we'd use it ourselves! We don't want to be locked in to a single operating environment. Consequently, I've ordered a complete rewrite of all our server and desktop products in Java. That way they'll run on my new machine without difficulty."

Gates pointed out that the rewrite should not be difficult since Microsoft's code was strictly object-oriented. "We've been pushing bad programming practice on our customers for years," he said, "so that they won't be able to compete with us. Our published libraries, such as MFC and .NET, aren't the least bit object-oriented, and Visual Basic is such a kluge that I'm amazed that anyone fell for it! Since our programmers take OO design seriously, their work will be much easier to modify than if they had been using that junk we promote publicly."

When asked about the time involved in getting the new Java versions of Office, SQL Server, Exchange, BizTalk and other essential applications to market, Gates

said it would be minimal. "We have a complete use case analysis, problem statements and UML models for all our products. Since we've spent so much time on this up-front analysis, the implementation should go seven or eight times faster than anything our competition can do. Even when you factor in the design time, we'll still get to market two or three times faster than will anybody who doesn't do this stuff—and that's most of the industry."

Gates chuckled. "Clowns. How can they imagine that they'll get anything done jumping right in to coding without any up-front work? They're like chickens running around with their heads cut off—in a constant state of panic that stops them from thinking clearly. Our competitors will have to toss out their implementations at least a dozen times before they get it right, or release a buggy product and get slammed by the reviewers. They're even using loosely typed languages like PHP! That alone should cost them six months of development!

"Not only that," Gates bragged. "We've developed a set of lightweight processes that work for us, and we follow them in a disciplined way."

Java Watch



Allen Holub is an architect, consultant and instructor in C/C++, Java and OO Design. Reach him at www.holub.com.

He shook his head. "It amazes me that even though we've known how to develop quality software in minimum time for years, nobody seems to be doing it! People just make all the same mistakes over and over again as if all this stuff was a dark secret. Think how many start-ups have failed just because they were in too much of a panic to spend a few weeks thinking about what they were doing before they did it. It's a waste, a terrible waste."

Software ports are expensive, and when asked about whether outsourcing would make sense, Steven Ballmer, Microsoft's CEO, said, "We do plan to outsource almost all of our core business in the future. In fact, I have a major round of layoffs planned for Christmas Eve. Outsourcing could indeed work here, given the quality of the up-front design and the fact that these products are well-known quantities without anything innovative going on."

Ballmer did indicate one extra benefit of outsourcing. "There are bound to be issues that come up once we get code into the real beta testers' hands. They'll have lots of useful suggestions, and incorporating these suggestions will make for a better product. That's something we know that all our customers have been waiting for." ■

Allen Holub is an architect, consultant and instructor in C/C++, Java and OO Design. Reach him at www.holub.com.

Hexoduku...the Fun Is Exponential!

Hello," I croaked into the phone, half-awake.

"Saddle up, cowboy, it's company-launching time."

"No it isn't, Fabian. It's 4:01 in the morning," I said as my bedside clock swam into focus.

"This is no time for time-zone nonsense, Larry. There's money dripping from the ceiling and we need to get our bucket under it pronto."

I started padding toward the kitchen to make coffee. When Fabian gets like this, there's no stopping him. But I had to try at least. "At the last company we worked at together, when they missed payroll, the CEO hid from the board by checking himself into a mental institution."

"Yeah, the dot-com days," said Fabian wistfully. "They're back, buddy! Web two-point-zero, baby, and we're going to strike it rich this time. Get in, get bought, cash out."

I put the water on to boil. "So where do I come in?"

"AJAX, Ruby on Rails, open-source licenses—I need you to sort that out, maybe do a tiny little bit of development. I'm more of an idea guy, you know that. And my idea? You'll flip. Geek lifestyle to the max. Check it out: You know Sudoku?"

"Some kind of honorable suicide per-

formed by samurai, right?"

There was an exasperated sigh. "It's the puzzle craze that's sweeping the nation. A 9-by-9 grid, further divided into 3-by-3 sections. Each row, column and section contains the numbers 1 through 9. Easy to learn, difficult to master. It's like the crack cocaine of logic puzzles."

"So your plan is some kind of Sudoku Web site? If it's so popular, surely they exist."

"Sudoku, sure. Everyone does Sudoku—grandmothers, teens, you name it. You don't get Web 2.0 funding for something that appeals to everyone. You have to appeal to geeks. Digg, Flickr, Make: It's all about the geeks. So, are you ready?"

I finished grinding the coffee. "Hit me." "A 16-by-16 grid with 4-by-4 panels. Guess what I call it?"

"Hexoduku?"

"Well, yeah," he said, a little disappointed. "I've already got the patent, copyright and trademark applications in place. The VC are standing in line to give me money. There's just one more thing I need..."

"An implementation?" I asked.

Fabian told me he had prototyped it. He'd drawn an empty grid and put it on

his blog with the caption, "You know: For the geeks." He'd received seven inquiries from interested venture capitalists within the day. "But, as for actual solvable puzzles—they're kind of hard to do by hand. I was thinking you could write the program to do it. Can you?"

"Well, you could do it with brute force, of course, but that would be ugly. I'm sure there are algorithms that are much faster."

"It would also need to be able to generate puzzles of different difficulty, so there are a different number of steps that can be logically taken. Ultimately, if you generate puzzles that had only a single logical step at a given point, that would be great."

"Hmm, I'm not sure that's possible, but I take your point that different difficulties could be assessed by the number of logical conclusions available. If in the first step there were, say, five cells that had only one possible number and you filled those in, and then there were three more cells that were foregone conclusions, that would be considered an easier puzzle than one where in the first case there were four logical conclusions to make and then two logical conclusions."

"Speed of generation would be

important, too."

"To sum up, you want an application that can generate a series of unique 16-by-16 Hexodukos, with a difficulty parameter that correlates with the number of cells with only one viable symbol, as quickly as possible."

I poured myself the first of many cups of fresh Kona coffee. "Here's my thought: If you want to be all Web 2.0 about it, why not offer a bounty for someone else to write the application?"

"A bounty?"

"Sure," I said. "I'll post an XML schema to www.knowing.net/hexoduku, and we'll give people until, say, May 1 to submit source code for a generator. Performance will count for 80 percent of the final standing, but we'll leave 20 percent for unit tests, code readability and so forth."

"All submissions under Creative Commons Public Domain declaration?"

"Of course."

"But what will we offer as a bounty?"

"I'll offer the winner a complete set of books—the finalists in the Jolt Awards 'general books' category, including titles by Joel Spolsky, Ken Pugh and Karl Fogel—as the prize. That's \$200 worth of books."

"No fooling?"

"No fooling." ■

Larry O'Brien is a technology consultant, analyst and writer. Read his blog at www.knowing.net.

Windows & .NET Watch



I Wanna Go Home

Sometimes, it's good to get out of the office, to shake you out of your routine and see things from another point of view. As I write this, I've escaped from the BZ Media headquarters on Long Island, and am working from BZ West, our satellite office just outside San Francisco. And yes, it's raining.

As I was driving my Chevy rental—50 bucks a day for a compact! Thanks, National!—I couldn't help noticing the billboards for hardware and software that dot the landscape here. Though not as plentiful as I'm sure they were in the go-go days of the dot-com era, these billboards—some of which are electronic—nonetheless are a reminder of how the high-tech world is so much more a part of life here than back in New York, where only the iPod seems to have penetrated the mass consciousness. It truly is, to borrow from a longtime publisher of software catalogs, a programmer's paradise.

As I stopped for breakfast on the way from my hotel to the office, I asked a local to confirm my directions. She first asked if my rental car had a GPS system. I said it did not. She asked where I was going, punched the address into hers, and displayed a map showing me exactly how to get to the office. An interesting contrast to what happens when you stop to ask directions in New York, I noted.

Only here, on the hills overlooking Silicon Valley, can a conversation about Lasik laser eye surgery morph into a debate over the pros and cons of open source. "Let me ask you," one man said to the other, "if you were going in for the

laser surgery, would you want your ophthalmologist using a machine that was created by a gang of tie-dyed rogues, with no established entity behind it, and if the doctor needed support, he could post a question to a message board and hope someone gets back to him before the

Industry Watch



David Rubinstein

patient goes blind?"

"Well," said the other, "at least I'd know the machine wouldn't give a Blue Screen of Blindness right in the middle of getting my corneas cauterized! And doctors would love it because the machines would be free as in Medicaid." Meanwhile, in New York, four words sum up Lasik eye surgery: Dr. Joseph Dello Russo. (This is not an endorsement of the doctor, but rather a recognition of his ubiquitous marketing skills. I'll never know if Dr. Dello Russo is good or not. To me, there's no margin of error, so I will continue to wear my glasses, which also lend me a much-needed air of intelligence.)

Finally, time for lunch at BZ West. I decided to stop at a Cingular store because my phone wasn't working. Before I left for California, I stopped at the Cingular store near my house to pick up the new phone. Three clerks were drumming their fingers on their desks, much like the "Maytag Repairman." They fell all over one another trying to sell me an ear piece. Here, I had to take a number—there were nine people ahead of me in this store in a Bay Area strip mall.

As an aside, I would say to my New York colleagues that it seems perfectly reasonable to take lunch at 1:00 pm Pacific time, despite the fact that you're scrambling around to get as much done

as possible by the end of the day, and my lunch has created a bottleneck for you. Boo-hoo. Get over it! (I, of course, will forget this in the first days I'm back in New York, and I'll be cussing and swearing at my West Coast colleagues for the audacity of taking lunch right when I'm trying to wrap things up for the day!) And because we're so tied to the New York office, the day seems to fly when you're in California. The New Yorkers are mostly gone by 2:30 pm Pacific time, so when their day ends, I guess mine does, too! There's a perk if I've ever seen one.

Then it was out to dinner with the boss and some cronies, where the conversation quickly turned to the debut episode of the final season of "The Sopranos." Finally, a conversation that didn't involve hardware, software or firmware. I didn't see the show, but these California dudes thought that "The Sopranos" wasn't realistic. I assumed they came to that conclusion because outside of Hollywood, I guess, you don't see many real ethnic Italians, as you do in New York. No hand gestures, and nary a "fuggedaboutit."

"Yeah, I couldn't believe it," said one of the guys at dinner. "In that scene where Tony calls Christopher in the middle of the night, you can see that the model phone Christopher was using only had 128MB of flash memory. I mean, *nobody* today would have less than 512MB. I just can't watch that show anymore. It's just too bogus!"

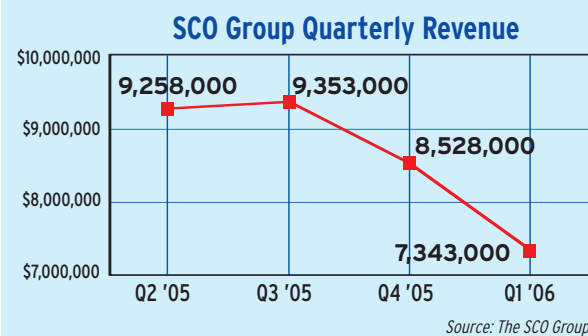
Like my mother used to say, "Too much of anything is just no good." Under the table, I began clicking my heels and silently repeating, "There's no place like home. There's no place like home." Ahh, fuggedaboutit. ■

David Rubinstein is editor-in-chief of SD Times.

BUSINESS BRIEFS

CMP Media announced that it's shutting down Software Development Magazine as of its May 2006 issue. Some of the editorial content from that publication will be folded into Dr. Dobb's Journal, another CMP publication. Software Development Magazine was launched as Computer Language in 1984; editor-in-chief Alexa Weber Morales was laid off in December 2005 . . . Consulting firm **Darwin Partners** is merging with **Suzsoft**, a provider of offshore development services based in China. The merger provides Darwin's U.S.-based clients with a single source for offshore delivery, according to Al Perkins, chairman of Darwin. Suzsoft was started in 2001 and its primary operations were in San Francisco and Suzhou, China. "The combined Darwin-Suzsoft management team brings to clients an integrated U.S.-China practice with experience in IT consulting directly relevant to CIOs of major U.S. corporations," said James Tong, CEO of Suzsoft . . . The board of directors of **Stellent** has announced a 3-cent-per-share quarterly dividend.

EARNINGS: The **SCO Group** reported a continued decline in revenue, putting its first-quarter total at US\$7.34 million, down from \$8.86 million for the same quarter a year earlier. The decline in revenue began in the last fiscal year and has continued in fiscal 2006. The decrease in revenue, the company said, was primarily due to continued competitive pressures on the company's Unix products and services . . . **MKS** reported a 27 percent increase in revenue for its fiscal 2006 third quarter. Revenue rose



from US\$10.6 million in the same period last year to \$13.4 million. Net income for the third quarter was \$1.6 million, or 4 cents per share, compared with a net income of \$0.8 million, or 2 cents per share, in the third quarter of fiscal 2005. The company also claimed its application life-cycle management revenue grew 41 percent year over year, from \$8.3 million to \$11.6 million . . . **Wind River Systems** reported an 11 percent increase in revenue for its fiscal 2006 fourth quarter, posting US\$70.2 million, as compared with \$63.2 million for the year-earlier period. GAAP net income was \$10.3 million, or 11 cents per share, compared with \$6.4 million, or 7 cents per share, for the 2005 fourth quarter. ■



CALENDAR OF EVENTS

- | | |
|---|---------------|
| LinuxWorld Conference & Expo
Boston
IDG WORLD EXPO
www.linuxworldexpo.com/live/12 | April 3-6 |
| Embedded Systems Conference Silicon Valley
San Jose
CMP MEDIA
www.embedded.com/esc/sv | April 3-7 |
| International Conference on Software Process Improvement
Orlando, Fla.
INTERNATIONAL INSTITUTE FOR SOFTWARE PROCESS
www.icspi.com | April 3-7 |
| International REXX Symposium
Austin, Texas
REXX LANGUAGE ASSOCIATION
www.rexxla.org | April 10-13 |
| Linux on Wall Street
New York City
LIGHTHOUSE PARTNERS & FLAGG MANAGEMENT
www.linuxonwallstreet.com | April 24 |
| LinuxWorld & NetworkWorld Canada
Toronto
PLUM COMMUNICATIONS
www.lwnwexpo.plumcom.ca | April 24-26 |
| MySQL Users Conference
Santa Clara
O'REILLY MEDIA
www.mysqluc.com | April 24-27 |
| IDUG 2006
Tampa, Fla.
INTERNATIONAL DB2 USERS GROUP
conferences.idug.org/namerica/2006 | May 7-11 |
| ASNApalooza (RPG Conference)
Tampa, Fla.
ASNA
www.asna.com/palooza | May 10-12 |
| STAR East
Orlando, Fla.
SOFTWARE QUALITY ENGINEERING
www.sqe.com/stareast | May 15-19 |
| JavaOne
San Francisco
SUN MICROSYSTEMS
java.sun.com/javaone/sf | May 16-19 |
| USENIX 2006
Boston
THE USENIX ASSOCIATION
www.usenix.org/events/usenix06 | May 30-June 3 |
| BREW 2006
San Diego
QUALCOMM
www.brew2006.com | May 31-June 2 |
| Software Security Summit East
Baltimore
BZ MEDIA
www.S-3con.com | June 5-7 |
| Tech-Ed
Boston
MICROSOFT
www.microsoft.com/events/teched2006 | June 11-16 |
- For a more complete calendar of U.S. software development events, see www.bzmedia.com/calendar. Information is subject to change. Send news about upcoming events to events@bzmedia.com.



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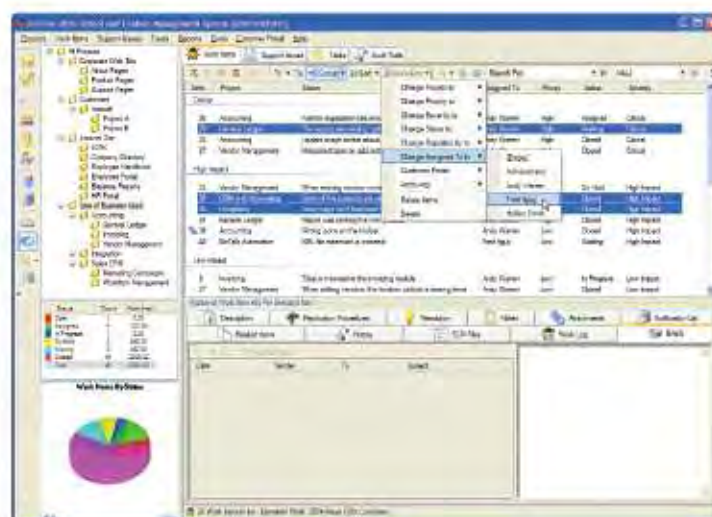
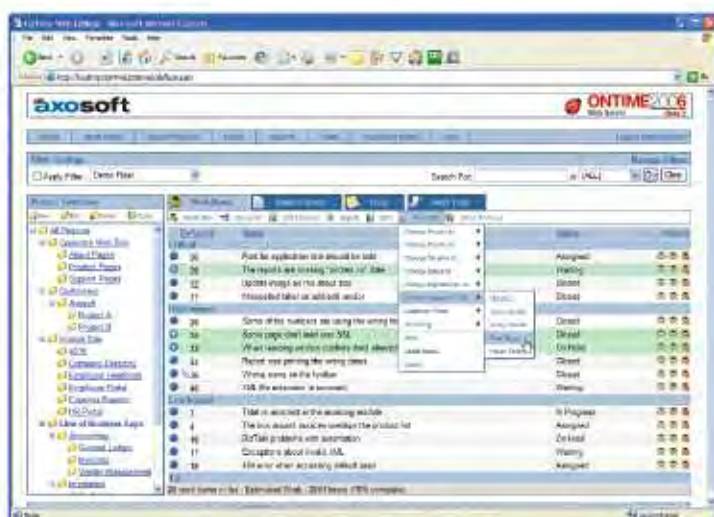
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